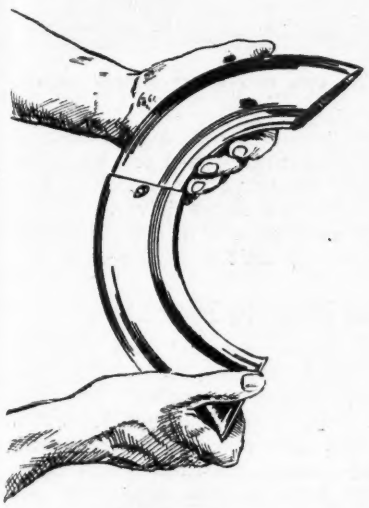
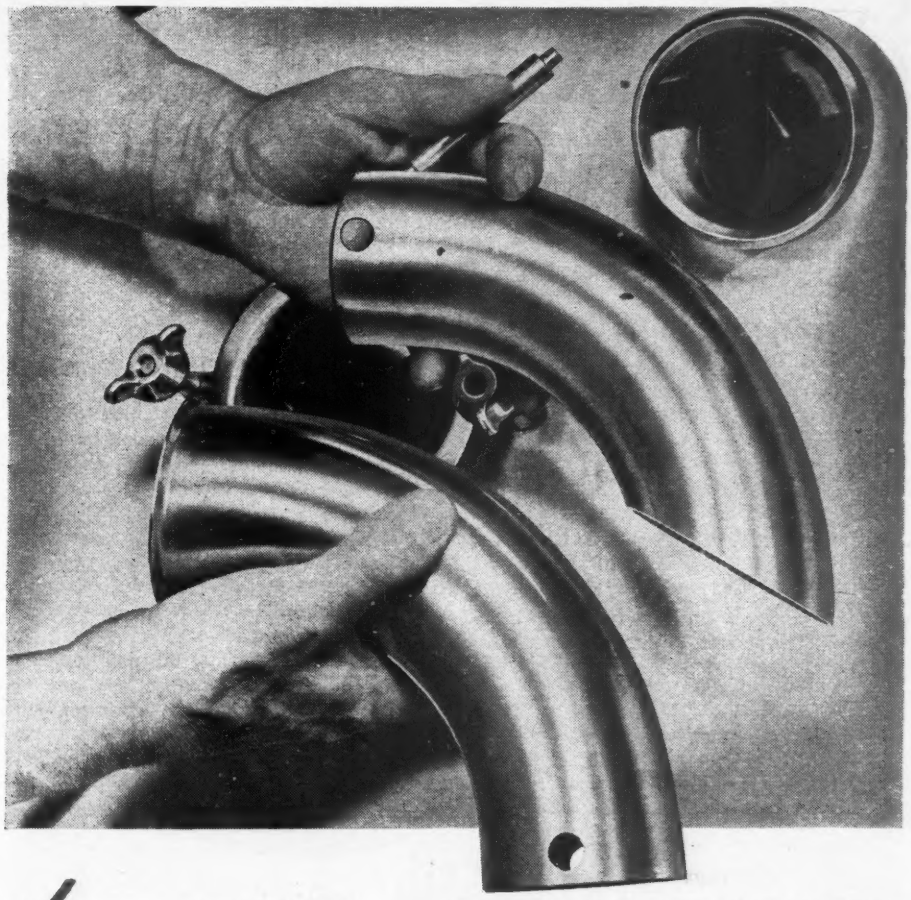
This stainless steel inlet for a milk storage tank is made in two pieces so that, when disassembled for washing, the entire surface is open to visual inspection.





Safe for MILK *or* MAYONNAISE

..strong..tough..resistant to wear

● Wherever tubing comes in contact with "delicate" products—even easily contaminated foods such as milk or mayonnaise — Republic ELECTRUNITE Stainless Steel Tubing is more than *SAFE* to use.

It's safe — because it is clean, sanitary, and easy to keep clean. It resists corrosion. It does not contaminate metallically. These statements have been proved by a 25-year record established by ENDURO—the metal from which this tubing is made.

And it's strong, tough, resistant to wear. There's no danger of breakage—no wearing through of the surface—because it's solid stainless steel throughout.

But there's even more to the story when you use tubing made by the ELECTRUNITE Process. There's a consistent uniformity of wall thickness, diameter, roundness and workability.

ELECTRUNITE Stainless Steel Tubing is made in a wide range of sizes, gauges, finishes and analyses. For further information, write to:

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION • CLEVELAND 8, OHIO
Export Department: Chrysler Bldg., New York 17, N. Y.

Republic
ELECTRUNITE
Reg. U. S. Pat. Off.
STAINLESS STEEL TUBING

Also Carbon Steel Mechanical Tubing—Aircraft Tubing—Boiler, Condenser and Heat Exchanger Tubes

HUBBERT

Manufacturers of Fine Kettles

All Hubbert Kettle Shells are seamless, die drawn from one single sheet. Shells have no welds to crack, corrode, contaminate or leak

SEAMLESS SHELLS

SUPER QUALITY

EFFICIENT

SANITARY

DURABLE

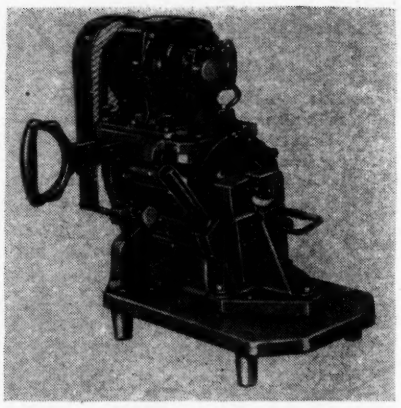
SAFE

Hubbert Seamless Drawn Steam Jacketed Kettles are *first* choice with the nation's *finest* Food, Chemical and Drug Processors.

Tanks
Valves
Kettles
Agitators
Special Equipment to *Your* Design in *Stainless Steel . . Nickel . . Monel*

Hubbert Kettles built to ASME & CANADIAN Codes.
Request certificates when ordering.
B. H. HUBBERT & SON, Inc., 1311 South Ponca St., Baltimore 24, Md.

E. G. JAMES CO., 316 So. La Salle St., Chicago 4, Ill.
Exclusive distributor, Hubbert equipment to meat packers.



Machine cuts and flares copper tubing.

bronze contact strip. Adjustment of contact operating speed can be easily made by changing the tension of two springs with a screw driver.

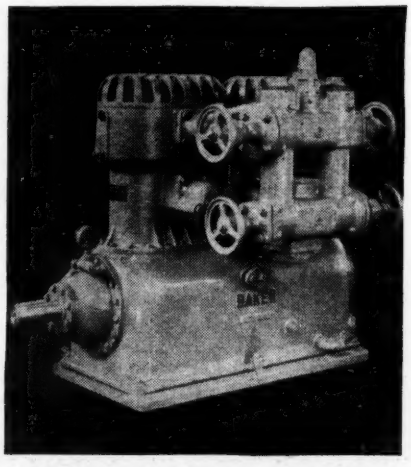
The maximum continuous-rotating speed of the unit is 1800 rpm.

Tube Flaring Machine

NOW OFFERED for the first time in quantity, an electric tube cutting and flaring machine is available from the T. J. Unger Mfg. Co., Dept. I, Dayton 10, Ohio. This machine, powered with a ¼-hp. motor, cuts, flares and trims copper or aluminum tubing in one operation and has a capacity of more than 5,000 flares in 8 hours of operating. Since the tubing does not revolve, any length of tubing can be handled. Removable jaws are available for various sizes of tubing. According to the manufacturer flares are spun and trimmed to a perfect fit, thus avoiding the possibility of leakage caused by crystallization of the metal.

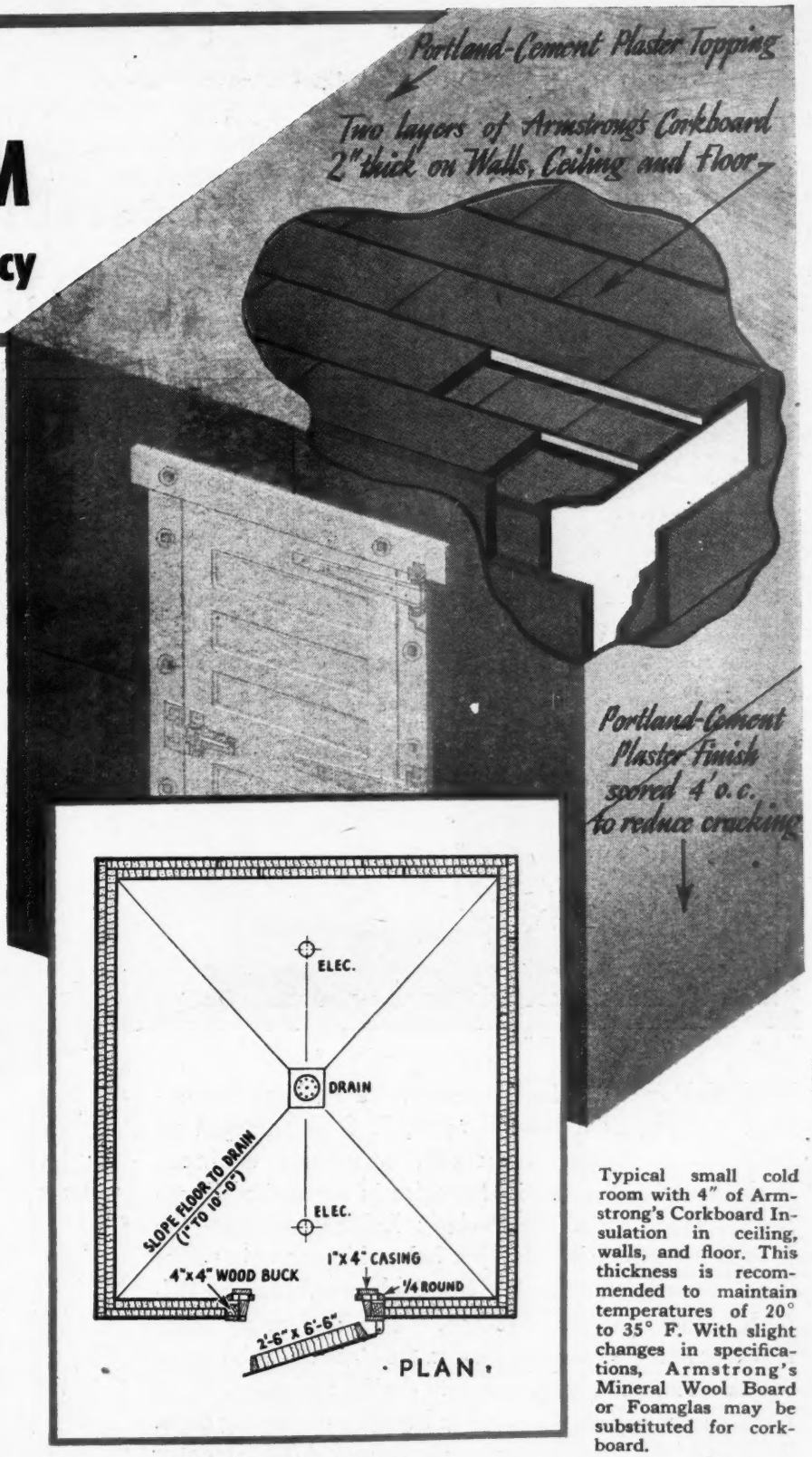
Ammonia Compressor

TO PRODUCE greater capacity in smaller size Baker Ice Machine Co., Inc., Dept. I, Omaha, Nebr. announces Model F82 ammonia compressor. Powered by a 75 hp. motor, the four-cylinder compressor has a capacity ranging from 32 T. at 9 psi. gage, to 106 T. at 58.6 psi. gage. It is 54 in. long x 36 in. wide.



High capacity ammonia compressor

How to build a COLD ROOM for maximum efficiency



TO BE EFFICIENT, a cold room must be both well planned and well built. Each detail, from location to insulation, requires careful consideration. Cold rooms, except freezers, may be located in any part of a building and may be built as single or multiple units, with one or more access doors. Multiple rooms, most flexible and generally more economical in operation, should be built in one block, if possible, for greatest economy.

Structural walls, floors, and ceilings around such a room should be of solid construction . . . concrete or solid brick rather than hollow tile. Avoid air spaces. For partitions and interior walls where building walls are not used as a base for the insulation, self-sustaining solid walls of the insulation material are recommended. When the existing ceiling height is greater than that needed for the cold room, a false ceiling is recommended with insulation laid on top.

The most important factors affecting the final economy of a cold room are the adequacy and efficiency of the insulation. For more than 40 years, Armstrong has been producing board type, low-temperature insulations and engineering their proper application. For cold rooms, Armstrong recommends three dependable insulation materials: Armstrong's Corkboard, Mineral Wool Board, and Foamglas*. For full information, write today to Armstrong Cork Company, Building Materials Division, 4201 Concord Street, Lancaster, Pennsylvania.

Typical small cold room with 4" of Armstrong's Corkboard Insulation in ceiling, walls, and floor. This thickness is recommended to maintain temperatures of 20° to 35° F. With slight changes in specifications, Armstrong's Mineral Wool Board or Foamglas may be substituted for corkboard.

* T.M. Reg. U. S. Pat. Off., Pittsburgh Corning Corp.

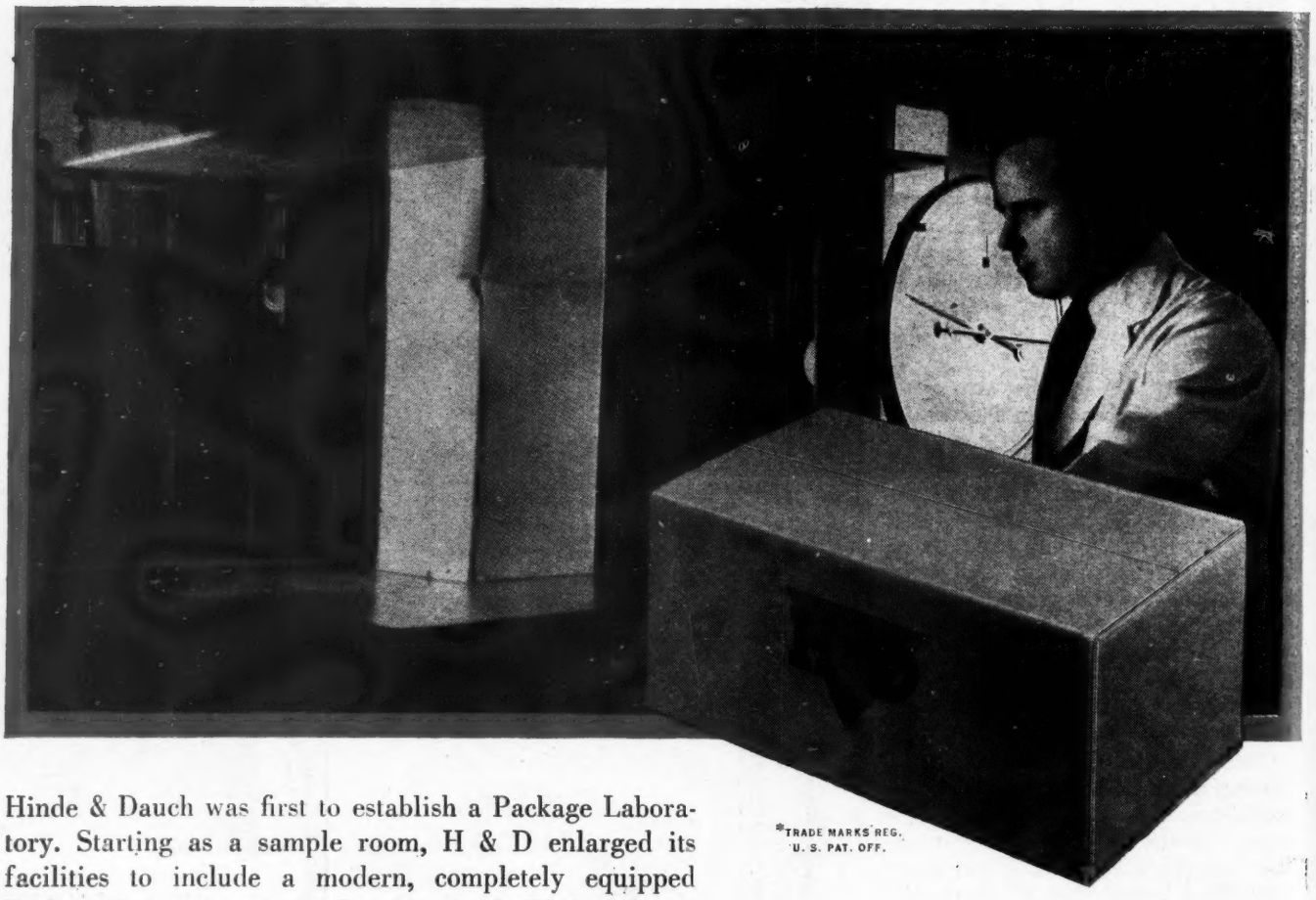
ARMSTRONG'S INDUSTRIAL INSULATION

Complete Contract Service For All Temperatures

From 300° Below Zero

To 2600° Fahrenheit

first to establish a PACKAGE LABORATORY



Hinde & Dauch was first to establish a Package Laboratory. Starting as a sample room, H & D enlarged its facilities to include a modern, completely equipped Package Laboratory in its factories in the United States and Canada. From the Package Laboratory came the LIFE PRESERVER*, the first baby chick shipping box; the first corrugated box for shipping canned foods; PRE-PAK*, the first unit package. These and many other H & D "firsts" were developed in the Package Laboratory where scientific construction and design are employed to increase packaging efficiency and reduce packaging costs. The Hinde & Dauch Paper Company, 4701 Decatur Street, Sandusky, Ohio.

*TRADE MARKS REG. U. S. PAT. OFF.

LOOK TO H&D FOR PACKAGING "firsts"

HINDE & DAUCH · *Authority on Packaging*

FACTORIES IN: Baltimore 13, Maryland • Buffalo 6, N. Y. • Chicago 32, Illinois • Cleveland 2, Ohio • Detroit 27, Michigan • Gloucester, N. J. • Hoboken, N. J. Kansas City 19, Kansas • Lenoir, N. C. • Montreal, Quebec • Richmond 12, Virginia • St. Louis 15, Missouri • Sandusky, Ohio • Toronto, Ontario • Watertown, Mass.

CATALOGS, BULLETINS

This digest of manufacturers' new publications is offered by FOOD INDUSTRIES Readers' Service as a convenience for executives. To obtain this literature, fill in the coupon, clip to your letterhead, and mail to FOOD INDUSTRIES.

Food Plant Equipment

Electric Equipment 1
Clarostat Mfg. Co., Inc.—Bulletin 100. A bound volume of eighteen different bulletins illustrating and describing various electric equipment such as potentiometers, rheostats, resistors, made by this company.

Liquid Separator 2
Selas Corp. of America—4-page illustrated folder describing new equipment for complete phase separation of immiscible liquids. Contains photographs of units, a cross-section flow diagram, dimension drawings, description of operation and possible uses.

Dust Collectors 3
The Thermic Engineering Co.—20-page catalog describing the dust collecting equipment available from this company includes detailed description of dust collectors. The Aerotec tube is described.

Pressure Reducing Valves..... 4
Leslie Co.—20-page Bulletin 461, illustrated in color giving engineering, operating and maintenance data on pressure reducing, differential and overflow valves for steam, air or gas services.

Power Transmission 5
Reeves Pulley Co.—Illustrated folder describing this company's speed control equipment. Includes data on various applications.

Unit Heaters 6
D. J. Murray Mfg. Co.—Catalog CUH-846A, descriptive of Grid Unit Heaters. 12 pages of illustrations, descriptions and specifications of unit heaters.

Water Treatment 7
American KAT Corp.—Four engineering data sheets covering different phases of water treatment are as follows: CL 10 on colloids; SC 12 on scale; CR 15 on corrosion; AS 10 on after-treatment.

Blowers 8
Roots-Connersville Blower Corp.—24-page bulletin 22-23-B-12 on rotary positive blowers contains illustrations, characteristic curves, cross-sections and exploded views to show operating principle and construction features.

Pneumatic System 9
Sprout, Waldron & Co.—Bulletin PV-546 describes and illustrates the Sprout-Waldron Pneu-Vac system. Lists features which make Pneu-Vac suitable for handling all types of free-flowing materials by air.

Filter Presses 10
T. Shriver & Co. Inc.—Catalog No 46 presents the story of the filter press—its method of selection, purpose of the filtration operation, types of filters, materials of construction, determination of requirements and costs.

Mixers 11
International Engineering Inc.—Catalog 101. 32-page technical bulletin illustrating and describing the mixing and process equipment manufactured by this company. Contains information on selection, estimating power requirements of mixers and gives detailed specifications for the various types of mixers. Theory of operation of turbine mixers is included. It is well illustrated with simple sketches and photographs. Catalog 110. 26-page catalog describing various types of portable and permanent propeller-type mixers. Bulletin No. 112 is an 8-page pocket size folder on ribbon mixers and blenders.

Heat Recovery 12
The Sims Co.—16-page catalog on the Sims Heat Exchanger and Sims Exhaust Gas-fired Boiler. Includes illustrations and tables of dimensions and capacities.

Chocolate Coolers 13
J. W. Greer Co.—Booklet presenting Greer Multi-Tier principle of conveying as applied to cooling of chocolate confectionery and chocolate coated biscuits and crackers.

Vacuum Sealing Machine..... 14
Anchor Hocking Glass Corp.—4-page folder describing Anchor Steriseal machine for high-speed vacuum sealing of glass-packed food products.

Plug Valves 15
American Car and Foundry Co.—Catalog No. S-46 containing 16 pages of illustrations and dimensions on ACF steel lubricated plug valves.

Pumps 16
Warren Steam Pump Co., Inc.—Bulletin-226 describes Warren steam heat vacuum pumps. Bulletin-229 describes Type 2HB two stage centrifugal pumps. Bulletins contain illustrations, dimensions and ratings of the various pumps.

Water Heater 17
O'Brien Steam Specialty Co.—4-page catalog on packaged water heating. Describes O'Brien all-bronze steam mixer water heater for 50 to 150 lb. steam pressure.

Feeders 18
Hardinge Co., Inc.—12-page catalog featuring Hardinge Constant - Weight feeder that maintains constant delivered weight of material to machine being fed.

Packaging 19
Robert Gair Co., Inc. has published a 10-page illustrated booklet "Precision in Packaging" describing the types and functions of all types of packaging machinery.

Unit Coolers 20
Kramer Trenton Co.—Bulletin on radial unit coolers for commercial refrigeration applications gives dimensions, fittings and performance data.

Strainers and Separators 21
American District Steam Co.—16-page bulletin No. 46-50 gives dimensions and list prices on Y-type, T-type and large pipe line Macomb type strainers for water or oil service and on vertical and horizontal separators for steam, air and gas service.

Industrial Cranes 22
Industrial Equipment Co. — Bulletin PG-648 describes portable gantry cranes and other industrial cranes.

Barrel Stand 23
Western Machine Works.—A leaflet describing a barrel stand that eliminates waste and simplifies dispensing. It shows how the barrel is held vertically or horizontally.

Materials Handling

Conveyor Belts 24
The Cambridge Wire Cloth Co.—A 4-page bulletin No. 84 describing and illustrating various types of wire belts.

Fork Truck 25
Automatic Transportation Co.—Four bulletins covering fork truck models THTF-L-3, 4, 5 and 6. Specifications for each of the models are given, together with operating engineering data.

Hoists 26
Lisbon Hoist & Crane Co.—8-page bulletin, "Bob-Cat—A Super Line Electric Cable Hoist," illustrated with cross sections of hoists.

Electric Hoist 27
Vulcan Iron Works—Bulletin A-407. 32-page booklet illustrating and describing the self-contained electric hoist made by this company. Includes a section on various safety devices incorporated in these hoists.

Belt Conveyor 28
Rapids-Standard Co.—6-page two-color folder entitled "Your Man Friday" describing Stevedore, Jr. power belt conveyor. Contains descriptions and photographs of all the latest developments, including cable-shift elevation device which facilitates adjusting operating pitch of belt while stacking materials at various levels.

Chain Hoist 29
Reading Chain & Block Corp.—Catalog No. 60. 36-page illustrated booklet giving information on the selection of chain hoists for different types of applications. Includes data on capacities, lifting speed,

Good until April, 1947

FOOD INDUSTRIES READERS' SERVICE

FOOD INDUSTRIES, 330 W. 42nd St., New York City 18

Please have manufacturer send me, without obligation, literature circled below.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48						

NAME ..... Title .....

FIRM OR AFFILIATION .....

ADDRESS .....

1-46

Depend on

OAKITE *Specialized*

Cleaning & Sanitation Materials

FOR Clean, Sparkling Truck Exteriors

OAKITE COMPOSITION No. 70

Standardize the easy, fast Oakite way to keep truck bodies looking sharp and bright. Use Oakite Composition No. 70, the sure-fire body-washing compound that quickly removes grease, oil, color-dulling traffic film. Easy to prepare and apply. Rapidly dries down without streaking. No squeegee or chamoising necessary. Regular use does not harm body finish, decals, top varnish. Try it TODAY!

FOR Odor-Free, Sanitary Truck Interiors

OAKITE TRISANITE

Yes, operators of food truck fleets specify Oakite TRISANITE to assure sweet-smelling, hygienically clean carrying areas. Cleans, deodorizes and disinfects in the same operation. Can be swabbed or sprayed on interior truck surfaces, after runs carrying fresh foods, or at intervals if you are hauling frozen foods. Odorless itself, OAKITE TRISANITE strikes odors at the source, leaves no tell-tale after-smell. Average ounce-per-gallon warm water solution amazingly economical.

IT'S FREE

Complete Story of Low-Cost Truck Maintenance Operations

There are many other Oakite materials and techniques specially designed to help you speed cleaning, degreasing, descaling in overhaul, maintenance and repair. For dependable, money-saving job data, write on letterhead for FREE copy of 36-page Oakite Automotive Service manual. There is no obligation, naturally.

OAKITE PRODUCTS, INC., 26G Thames St., NEW YORK 6, N. Y

Technical Representatives in Principal Cities of U. S. & Canada

OAKITE

Specialized Industrial Cleaning

MATERIALS • METHODS • SERVICE

applications and operating efficiencies of the various types of hoists made by this company.

Motorized Hand Truck 30
Automatic Transportation Co.—The "Blue Book of Transporter Users" lists the outstanding companies in various industries using the transporter motorized hand truck made by this company.

Fork Truck 31
Crescent Truck Co.—4-page illustrated leaflet describing the palletier fork truck made by this company. Diagrams give dimensions of the different models. Specifications are included.

Lift Trucks and Tractors 32
Mercury Mfg. Co.—Vest-pocket Catalog No. 201-6 contains 48 pages of detailed information on construction features, capacities and designs of all models of gas tractors and telescopic lift trucks.

Plant Supplies

Washing Powders 33
Cherry-Burrell Corp.—12-page bulletin contains suggested cleaning procedures for milk, butter, cheese, and ice cream plant equipment, with special articles on milkstone control, churn care and conditioning, cleaning plant floors and walls, and descaling bottle washers.

Benzoates 34
Seydel Chemical Co.—Revised booklet "A Treatise on Benzoates," contains preserving data and a resume of Federal and all State laws bearing on the use of benzoate of soda in food products and beverages.

Static Electricity 35
Acheson Colloids Corp. — Technical bulletin No. 140.1 on control of static electricity developed on drive and conveyor belts. Describes application of colloidal graphite to underside of belts and methods of grounding shafts to which pulleys are affixed.

Emulsifiers 36
R. T. Vanderbilt Co., Inc.—Bulletins on Vanilite and Vanade, emulsifying agents for making richer cakes without increasing shortening or decreasing milk.

Control Equipment

Electrical Equipment 37
Ohmite Mfg. Co.—Bulletin No. 126, 4-page catalog illustrating Riteohm precision resistors made by this company. Capacities, maximum voltages, and list prices are given.

Instruments 38
Bailey Meter Co.—Bulletin 17. 8-page bulletin illustrating and describing this company's instruments and controls for the process industries. Contains information on controllers, control components, difficult control systems, multi-element systems, measuring components, and instrument combinations. It is well illustrated with diagrammatic sketches.

Instruments 39
The Bristol Co.—Bulletin F 1603. Describes in detail the features of the bellows type differential flowmeter body which requires no mercury. A cross-sectional drawing illustrates the method used to transmit bellows motion to the pen arm. Ranges available are listed. Bulletin No. pH 1302 describes this company's line of pH control instruments. Includes engineering and technical information relative to pH theory and measurement, and describes the various electrode assemblies and accessories offered. Bulletin T 825 features dairy thermometers, including in-

formation on temperature sensitive bulbs and fittings of both recording and mercury stem indicating type. Bulletin TA 827 gives specifications and flow diagrams of this company's high-temperature short-time control system. Bulletin T 829 features flow diversion valves and milk flow thermal limit controllers used in the milk industry.

Photo-Electric Controls 40
Photoswitch, Inc.—2-page leaflet illustrates and describes the Series 20 and 21 photo-electric controls manufactured by this company. Includes specifications and installation sketches.

Instruments 41
Wheelco Instrument Co. — Bulletin D-602-4. 4-page booklet illustrating and describing the portable pyrometers manufactured by this company. Includes data and specifications on the various accessories required for use.

Dynamometer 42
W. C. Dillon & Co., Inc.—Booklet entitled "The Dillon Dynamometer Manual" gives information on the traction type dynamometer used in the simplification of testing and weighing procedures in many industries.

Miscellaneous

Slide Chart 43
Finding the proper stainless steel tubing for any processing job will be easier for designers who use a new slide chart prepared by The Carpenter Steel Co. This chart gives actual figures on velocity constants and mass velocity constants. It provides for easy and accurate calculations on jobs where stainless tubing is used.

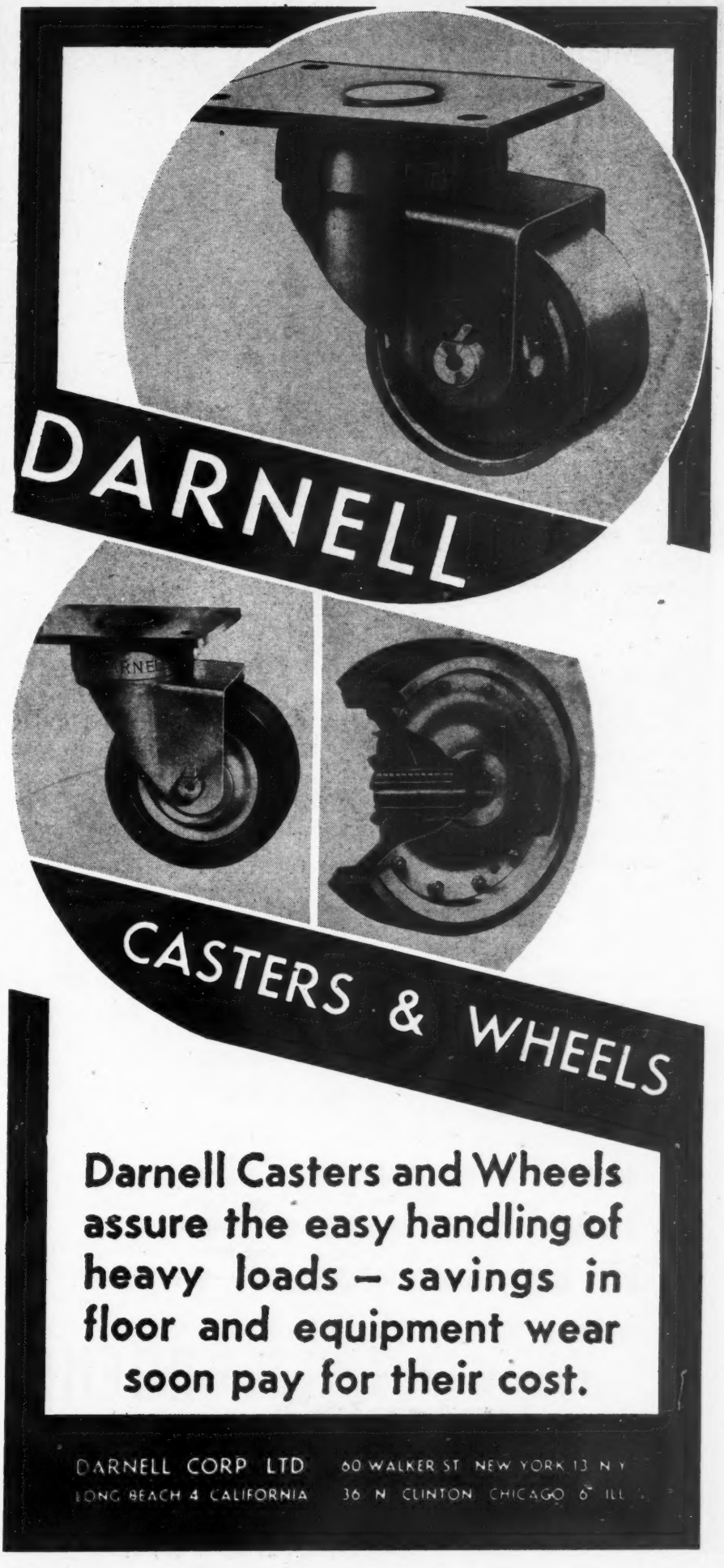
American Standards 44
Eight hundred forty-five standards are listed in a booklet published by the American Standards Association. Included are definitions of technical terms, specifications for metals and other materials, and safety provisions for the use of machinery, methods of work and methods of test for the finished product. They reach into every important engineering field, and are used by many government departments.

Protective Coating 45
Amercoat Div., American Pipe & Construction Company.—An 8-page technical bulletin, streamlined for ready reference, which gives complete factual information in condensed form about the entire Amercoat line. Various branches of the food industry will find specific recommended applications for solving their individual problems.

Fire Protection 46
Randolph Laboratories, Inc.—A 24-page booklet No. R-5827 entitled "How to Fight Fires and Protect Property." It tells with photographs and diagrams what type fire hazards to recognize, how to mobilize employee fire defense, and what are the approved methods of operation of various types of fire extinguishers.

Bearings 47
New Departure Division, General Motors Corp.—A series of three booklets on ball bearings for designers and engineers. Parts I and II deal with the principles, bearing types and fundamentals of mounting practice, and describe details of shaft and housing designs. Part III covers inclosure and lubrication for various operating conditions.

Combustion 48
The Bryant Heater Co.,—First ten of a series of data sheets prepared for combustion and process engineers includes mathematical tables, properties of gases, metals and other materials, and gas orifice capacity tables. Available in notebook punched sheets.


DARNELL
CASTERS & WHEELS
Darnell Casters and Wheels assure the easy handling of heavy loads – savings in floor and equipment wear soon pay for their cost.
DARNELL CORP LTD
LONG BEACH 4 CALIFORNIA
60 WALKER ST NEW YORK 13 N Y
36 N CLINTON CHICAGO 6 ILL

Added sales power through Vitamin Enrichment

The period of heavy competition among all foodstuffs draws nearer and nearer.

Mrs. Homemaker of today knows that vitamins are essential food elements for proper nutrition. You can count upon her to check your labels for vitamin declarations. She will buy enriched food values wherever possible.

Be ready to meet this challenge. Study the possibility of improving your product with 'ROCHE' vitamins. Let enrichment *help your product on the steep climb ahead.*

ROCHE VITAMIN DIVISION

HOFFMANN-LA ROCHE, INC., Nutley 10, N. J.

FOOD TECHNOLOGY

NEW DISCOVERIES AND INVENTIONS

FATS AND OILS

Emulsifying Agents

COMPOSITIONS of remarkable emulsifying power are obtainable from glycol glucosides, preferably propylene glycol glucoside obtained from glucose, according to a recent patent. The glucoside is reacted with ethylene oxide or other oxyethylating agent in the proportion of 4 to 12 equivalents of ethylene oxide to each calculated molecular weight of the glucoside. In this range outstanding results are obtained with the product of the reaction of six mols of ethylene oxide per calculated mol of the glucoside. The oxyethylene ether is then reacted with oleic acid in the proportion of 4.5 mols of the acid for each calculated mol of the oxyethylene ether. In tests of emulsifying power, this preferred product gives a water absorption value of the order of 2500. Several examples are given in detail illustrating typical processes and compositions.

Digest from U. S. Patent 2,407,003, issued September 3, 1946, on an application dated October 30, 1944, to W. C. Griffin, Newport, Del., and assigned to Atlas Powder Co., Wilmington, Del.

CEREAL PRODUCTS

Protein from Peanuts

PRODUCTION of different protein fractions from peanut meal is the object of a recently patented process, which is an improvement on the known method of extracting total protein by means of an alkaline solution and subsequently precipitating the protein by addition of acid to a pH of 4.5. In the present instance the protein is extracted by means of a sodium hydroxide solution of pH of approximately 7, using a meal-to-solvent ratio of 1:3. After the clear extract is separated from the residue it is acidified to adjust the pH to from 5.9 to 6.1. The precipitated protein is a semi-fluid, plastic, coherent mass which can be dried to yield a white, stable powder that can be reconstituted by the addition of water. This is known as protein 6. After its removal the remaining extract is acidified to a pH of 4.5, precipitating a granular white solid, known as protein 4.5. It also can be dried to a white powder that can be reconstituted as a fine suspension by addition of water. Thus protein fractions of different characteristics are obtained in yields of about 30 percent of protein 6 and 15 percent of protein 4.5, by weight, from peanut meal.

Digest from U. S. Patent 2,405,830, issued August 13, 1946, on an application dated July 19, 1944, to G. W. Irving, Jr., A. L. Merrifield, R. S. Burnet, and E. D. Parker, and assigned to the United States of America.

SUGARS

Sucrose Affects Surface Tension of Molasses

IF the surface tension of diluted molasses is plotted against the sucrose concentration of the solution, the resulting curve is of parabolic form, indicating adsorption according to the Freundlich equation. The presence of colloidal adsorbable substances in molasses is well-known Adsorption on sucrose crystals is borne out, not only by the surface-tension-concentration curve just mentioned, but also by the fact that there is a temperature rise when sucrose is added to molasses (heat of adsorption). The rise is greater if the sugar is pulverized to increase its surface.

Furthermore, by treating molasses with very large amounts of carbon in the cold (100 g. animal charcoal and 50 g. activated vegetable carbon to 200 g. of molasses and 200 g. of water) a solution of lower Brix and increased surface tension was obtained. On concentrating in vacuo to 84 percent solids, the sucrose crystallized spontaneously and in the course of a day or two most of the sucrose in the original molasses crystallized out.

More fundamental than the reducing sugar-ash ratio in judging molasses, is the relation of surface tension to sucrose content. Molasses samples with curves above the curve shown are probably underexhausted. The data and methods described are expected to help clarify the subject of molasses exhaustion by showing how to find out whether or not the critical ratio of sucrose to surface active impurities has been reached.

Digest from "The Influence of Adsorption on the Crystallization of Sucrose from Impure Solutions," by S. E. Coalstad, *Journal of the Society of Chemical Industry*, vol. 65, 206-08, July, 1946.

Index to Abstracts

FATS AND OILS
Emulsifying Agents 171

CEREAL PRODUCTS
Protein from Peanuts 171

SUGARS
Sucrose Affects Surface Tension of Molasses 171

DEHYDRATION
Dehydrating Cheese 171

DAIRY
Frozen Homogenized Milk 172

ASSAY METHODS
Calcium-Sequestering of Sodium Polyphosphate 176
New Tests for Flour 176

ENGINEERING
Flame Peeler 178
Nut Blanching Machine 178

VITAMINS
Ascorbic Acid and Carotene in Dehydrated Peaches 180

MISCELLANEOUS
Tasting Panels 182
Health of Dairy Cows Unaffected by DDT 184

DEHYDRATION

Dehydrating Cheese

CHEESE containing natural or added fats can be dehydrated in a direct process without liquefaction or exudation of the contained fats or loss of volatile flavors. The crux of the method recently patented, is a preliminary drying of thinly shredded particles of cheese at a temperature below the melting point of the fats. This results in the formation on the shreds of dried, hardened surfaces which entrap the fats and flavors. Thereafter the surface-hardened shreds of cheese may be further dehydrated without loss of fat at any suitable and efficient temperature above that of the melting point of the contained fat.

Natural full-fat cheese containing 38 percent moisture may be shredded and allowed to fall through a current of drying air at about normal room temperature onto trays or screens. During this interval the moisture will be reduced to 33 percent and the surface-hard-

YOU'RE ALWAYS SURE
With A LIQUIDOMETER
Tank Gauge

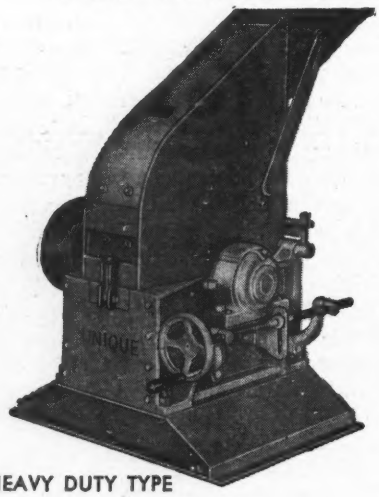
WRITE for COMPLETE DETAILS.

"LIQUIDS WORTH STORING ARE WORTH MEASURING"

THE LIQUIDOMETER CORP.
38-14 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

ROBINSON
PROCESSING UNIQUE EQUIPMENT

HAMMER MILLS



HEAVY DUTY TYPE

Continuous full capacity production. Hard iron, interchangeable grinding plates. Self-aligning bearings. Automatic electro-magnet separator prevents tramp metals from entering grinds. Sturdy construction. Designed by experienced engineers whose reputation is founded upon doing things right. Literature available. Inquiries invited.

ROBINSON MANUFACTURING CO.
Plant: Muncy, Pa.
SALES REPRESENTATIVE
MERCER-ROBINSON COMPANY, INC.
30 CHURCH ST., NEW YORK 7, N. Y.

ened particles will not coalesce. Further drying on the trays in a current of air at the same temperature will reduce the moisture to 8 or 12 percent in one hour, completing the preliminary dehydration. Final drying takes place at a temperature of at least 145 deg. F., reducing the moisture content to three percent. The product may then be compressed into cakes, with or without the addition of an emulsifier or flavoring material. Advantages of the process are savings of weight and space for storage and shipping.

Digest from U. S. Patent 2,401,320, issued June 4, 1946, on an application dated May 3, 1943, to G. P. Sanders, Arlington, Va., and dedicated to the free use of the People in the territory of the United States.

DAIRY

Frozen Homogenized Milk

EXPERIENCE with frozen homogenized milk on hospital ships during World War II showed variation in acceptability of the thawed milk with respect to flavor and separation of the caseinate system. Tests have been made to determine the reasons for this variation in different lots of milk, all of which presumably were processed, frozen and stored in the same manner. The tested milk was obtained in quart containers from a commercial dairy, frozen in the original containers, stored in constant-temperature freezers, and thawed at room temperature. Freezing and storage temperatures of 14 deg. F., −27 deg. F., and −40 deg. F. were variously used during the tests, and the following conclusions were reached.

The lower the freezing and storage temperature, the longer the milk remained normal. Milk frozen and stored at 14 deg. F. had a slightly flat flavor when thawed after 21 days, and was definitely flat with slight separation after 89 days. At the two lower temperatures, milk remained normal for 115 days at −27 deg. F., with indications that it would remain normal still longer at −40 deg. F.

Homogenized milk frozen and stored at one temperature could be moved to a lower temperature without developing any abnormalities, but became abnormal in appearance and flavor when moved to a higher temperature.

Frozen homogenized milk exposed to room temperature for one-half hour or more during its stor-

(*Continued on page* 176)

to enrichment?

MANUFACTURERS of food products are becoming increasingly aware of the "sales appeal" contained in the words "enriched" or "vitamin-fortified".

Housewives at the nation's food stores are *looking for* these words more and more often. They want better nutrition for their families.

All the items shown on these two pages are regular family purchases. A great many mothers would welcome fortification of *all* of them.

Many manufacturers of candy, cereals, baby food, corn meal and other foods *have* already fortified—making a genuine contribution to better nutrition and at the same time increasing the "sales appeal" of these products.

It is interesting to note that, in some of these fortified foods, the quantity and/or quality of the proteins have been improved and at the same time appropriate vitamin levels have been achieved.

If you are considering fortifying one or more of your food products, remember this: If there are no definitions and standards for enrichment of the products you make, you may *fortify* without hesitation.

Standard Brands' experience in the food fortification field—and its products for vitamin B-complex, vitamin D and protein supplementation of foods—place this company in a position to render valuable assistance to you on your food problems.

We will be glad to assist any manufacturer who may need help in fortifying food products. We invite you to discuss your needs in confidence with one of our executives. Write to the address below.

Products containing
VITAMIN D

Fleischmann's Hy-Dee
Irradiated Dry Yeast

Fleischmann's Irradiated Dry Yeast
Type 700-H

Standard Brands Viosterol
(Activated Ergosterol) Steenbock Process

Products containing
NATURAL B-COMPLEX FACTORS

Fleischmann's
Pure Dry Primary Yeasts *(Brewer's Strain)*

Fleischmann's
Bee-Flex Products

Fleischmann's
Brewer's Yeast Extract Types 3 and 41

Fleischmann's
Yeast Extract and Liver

STANDARD BRANDS INCORPORATED

Strong Cobb Division

Bulk Pharmaceutical Department • 595 Madison Avenue • New York 22, N. Y.

When you run your thumb over a "cleaned" surface, do you feel a greasy film? Then you know that your cleaner is removing only part of grease and dirt. It's time to look into Metso Cleaners.

Metso saponifies animal and vegetable fats and suspends them until flushed away. A Metso-cleaned surface is grease-free, clean and *bright*, for Metso also curbs corrosive action.

The return of the coupon brings you a free trial sample.

Philadelphia Quartz Company
Dept. D, 125 S. Third St.
Philadelphia 6, Pa.

METSO
Cleaners

Phila. Quartz Co. Metso Cleaners
Send sample and directions for cleaning.....
.....
[INSERT KIND]
NAME .....
COMPANY .....
ADDRESS .....
CITY .....

age period, with subsequent storage at a temperature higher than the initial storage temperature, was either flat or oxidized when thawed, even though normal in appearance.

Digest from "Frozen Homogenized Milk. I. Effect of Freezing and Storage Temperature on the Physical Characteristics of Homogenized Milk," by Lt. Col. C. J. Babcock, Maj. R. N. Roerig, Capt. J. N. Stabile, Capt. W. A. Dunlap, and Col. R. Randall, *Journal of Dairy Science*, vol. 29, No. 10, October, 1946.

ASSAY METHODS

Calcium-Sequestering Of Sodium Polyphosphate

A PHOTOMETRIC method for precisely determining the ability of molecularly dehydrated sodium phosphate to sequester calcium has been developed. By titration with standard $CaCl_2$ solution, using a filter photometer and graphical computation it is possible to ascertain the point at which a precipitate first begins to form. Calcium values are affected by the pH level to which the sample solution is adjusted before titrating. The method has a limit of uncertainty of ± 0.4 for sodium tripolyphosphate having an average calcium value of 10.4.

Conditions of the determination must be rigidly standardized, and any departure from these conditions should be noted in expressing results. Where performance under conditions of actual use is required, the method may be modified, but with the understanding that the resulting data cannot be compared directly with data obtained by using the written method.

Digest from "Method for Calcium-Sequestering Value of Phosphate Water Conditioners," by B. C. Hafford, F. Leonard and R. W. Cummins, *Industrial and Engineering Chemistry*, Analytical Edition, vol. 18, no. 7, 411-415, July, 1946.

New Tests for Flour

AN instrument which determines particle sizes by photo-electric measurement of sedimentation rate of a flour suspension, and reveals the degree of grind in the mill, can be used to check the suitability of a flour for cake baking, or for some kinds of bread. Particle size has not been shown to be an important factor in flour for cracker baking.

Physical measurements in which the resistance to mixing by a dough, or the effect of a mechanical stress on it are indicated graphically, afford an effective means of evaluating flour for use in crackers, cookies or cakes. Five samples of flour arranged in decreasing order

CASE HISTORY No. 11

One in a series of factual experiences of a group of American manufacturers with Multiwall Paper Bags.

COST COMPARISON
(Per Ton)

	Burlap Bags	100-lb. Paper Bags
Container cost	$2.00	$ .98
Labor cost	.56	.18
Total container and labor cost	$2.56	$1.16
Saving per ton, paper over fabric		$1.40

CLASS OF PRODUCT PACKED

CEMENT	FERTILIZER ✓
CHEMICALS	FOOD
FEEDSTUFFS	MISCELLANEOUS

PRODUCT CHARACTERISTICS

ABRASIVE	GRANULAR
CORROSIVE	HEAVY ✓
DELIQUESCENT	HYGROSCOPIC
FLUFFY	LIGHT
FREE-FLOWING ✓	VISCOUS

ST. REGIS BAG PACKAGING SYSTEMS are made in a variety of capacities, speeds, and manpower requirements to suit specific products and plant layouts. Machines are available in types to meet the special characteristics of a wide range of products, with filling speeds as high as twenty-four 100-lb. bags per minute.

They struck it rich by changing to a

ST. REGIS PACKAGING SYSTEM

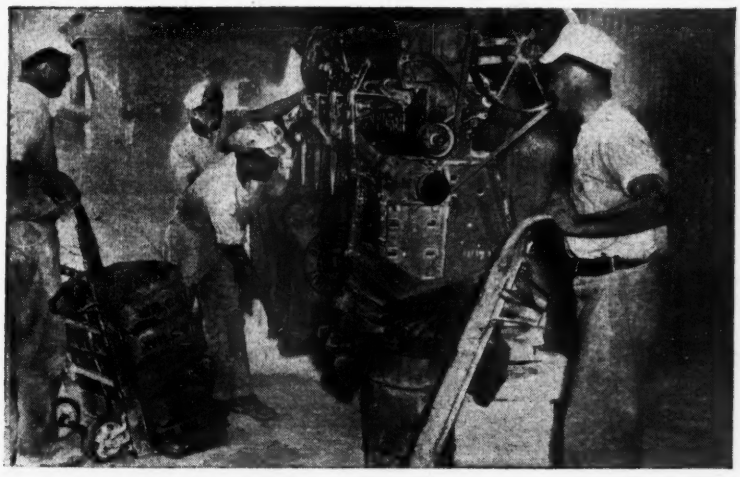
Surveying its packaging costs with a critical eye, a limestone mining company dug deeper into the facts and uncovered a rich "find"—considerably lower packaging costs and a better container for its product.

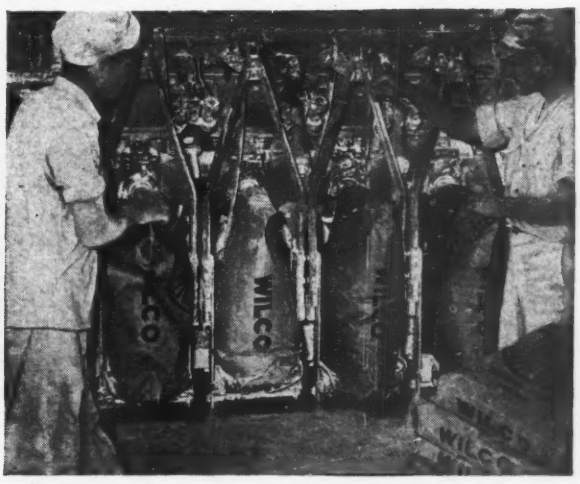
This company—Willingham-Little Stone Company of Atlanta, Ga.—mines and processes dolomitic limestone, which is sold primarily as a neutralizer for acid soils. Formerly the product had been packaged in burlap bags. Then the company changed to a St. Regis Packaging System (packer and multiwall paper valve bags). The economies resulting from this modern packaging system were far beyond expectations:

- Container costs were reduced by 51%; labor costs went down 68%—a total reduction of 55% in packaging costs!
- Packaging output jumped from 15,000 lbs. to 40,000 lbs. per hour—a 166% gain!
- Customers expressed enthusiastic approval of Multiwalls, noting that they virtually eliminated siftage and made a cleaner, easily-handled package.

This "case history" is one of many examples of the outstanding savings made possible by St. Regis Packaging Systems in the rock products, chemical, food, fertilizer industries. For the complete picture story of this efficient operation, mail the coupon to the nearest St. Regis office.

Left: The St. Regis 107-FC packer, which simultaneously fills and weighs 100-lb. multiwall paper valve bags.
Right: Four filling tubes permit uninterrupted packing.





St. Regis MULTIWALL PAPER BAGS

ST. REGIS SALES CORPORATION
(Sales Subsidiary of St. Regis Paper Company)

NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
BALTIMORE 2: 1925 O'Sullivan Bldg. SAN FRANCISCO 4: 1 Montgomery St.

Mail this coupon for the complete story

Allentown Birmingham Boston Cleveland Dallas Denver
Detroit Franklin, Va. Los Angeles Nazareth, Pa. New Orleans
No. Kansas City, Mo. Ocala, Fla. Oswego, N. Y. Seattle Toledo
IN CANADA: St. Regis Paper Co. (Can.) Ltd., Montreal, Vancouver.

Without obligation, please send me full details regarding "Case History" No. 11, outlined above.

NAME_____

COMPANY_____

ADDRESS_____

IT'S
Easy Sailing
WITH
Spiceolates
THE BETTER SPICE FLAVORS
20
You don't have to wish for better Spice Flavors. SPICEOLATES is the answer!
Send for the new . . . detailed . . . informative SPICEOLATE BROCHURE
D&O

DODGE & OLCOTT, INC.

180 VARICK STREET, NEW YORK 14, N. Y.

BOSTON • CHICAGO • PHILADELPHIA • ST. LOUIS • LOS ANGELES

Plant and Laboratories, Bayonne, N. J.

of stability, strength, and spring were found useful for cracker baking in the same order, indicating that physical nature of the gluten is the main factor influencing the suitability of flour for this kind of baking.

The "dextrin test" of Kent-Jones and Amos distinguishes the alpha-amylase activity of the flour from its beta-amylase activity, and if it is excessively high the flour may yield a sticky dough and crumb in the loaf. Flour produced from sprouted wheat has a high alpha-amylase activity. There is a good correlation between stickiness of crumb in breads of the Irish soda-bread type that are leavened chemically and the dextrin figures of the flour used in making them. Low dextrin flours give better results in baked goods of this type.

Digest from "New Routine Tests in Examining Wheaten Products," by A. J. Amos, *Chemistry and Industry*, 372-73, Oct. 12, 1946.

ENGINEERING

Flame Peeler

A DEVICE for peeling agricultural products, such as potatoes, carrots and onions, comprising a furnace and means of conveying the products through the furnace, and for tumbling them about to expose all surfaces to the radiant heat, is the subject of a recent patent.

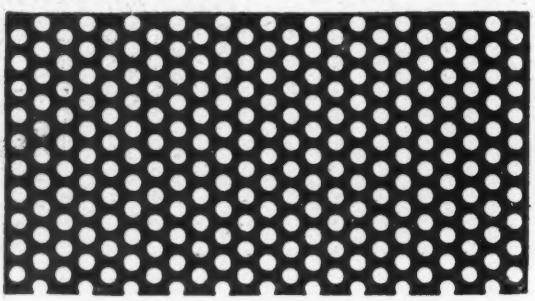
It is claimed that the temperature of the furnace and the conveyor speed can be so regulated, that the products are heat-penetrated only through the peelings, to char, burn or carbonize them, without subsequently affecting the under surface. The peelings can then be readily removed by one of a number of well known methods.

Digest from U. S. Patent 2,403,923, issued July 16, 1946, on an application dated June 25, 1943, to G. T. Hemmeter, Berkeley, Calif., and assigned to the United States of America.

Nut Blanching Machine

EASILY and quickly removable blanching cylinders comprise one feature of a recently patented machine for blanching peanuts and other roasted and partly roasted nuts, particularly those with thin skins that must be removed before the nuts are subjected to further processing. Another feature is a means for recovering the meal and hearts of peanuts broken in the blanching operation and usually wasted with the chaff. The machine comprises a hopper from which pea-

SCREENS OF ANY TYPE . . .



made to your specifications

For any food screening process, Hendrick will fabricate Perforated Metal Screens to your specifications. Besides assuring fast, full clearance and long service life, these screens are free from burrs or sharp edges, an essential point in many sizing operations.

Hendrick Perforated Metal Screens are furnished in any desired shape and size of opening. They are manufactured in stainless steel, copper, bronze, Monel, aluminum, or other commercially rolled metals.

Write for detailed information.

SEE OUR CATALOG IN SWEET'S

HENDRICK

Manufacturing Company

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

49 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

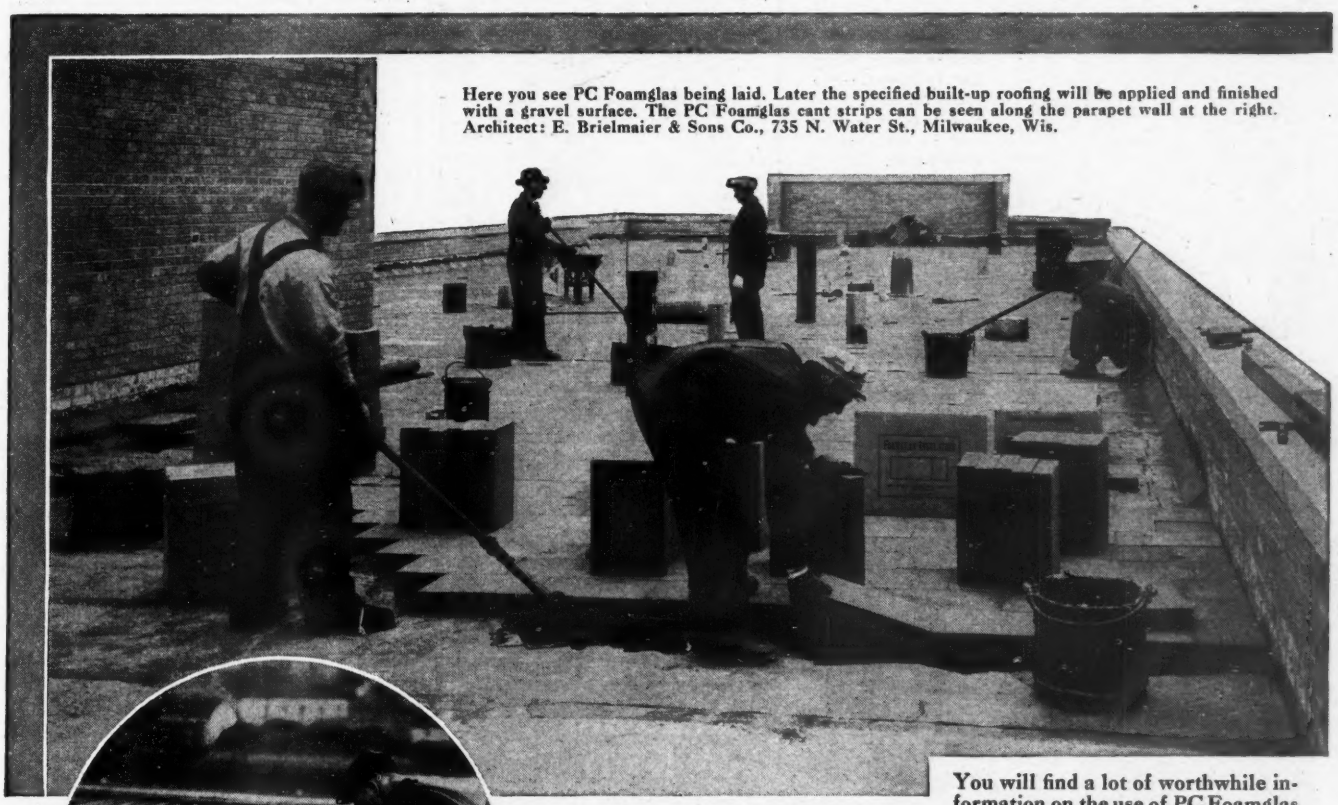
ON JOBS THAT ARE TOO TOUGH FOR OTHER INSULATING MATERIALS . . .

PC FOAMGLAS insulates permanently

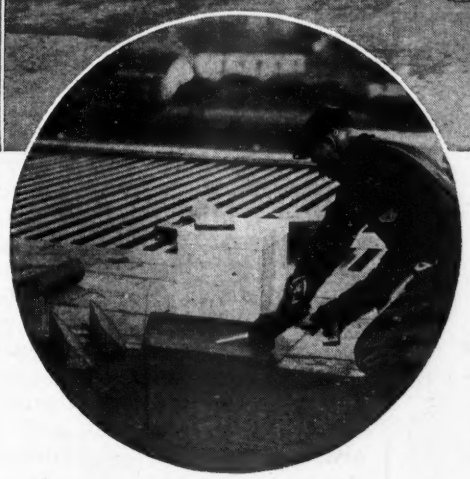
PC Foamglas is not affected by moisture, vapor, vermin, or the fumes of most acids. It is fireproof, waterproof. It does not swell, rot, flake, warp or check. Thus, factors that cause many roof insulation failures do not cause Foamglas to lose its original insulating value.

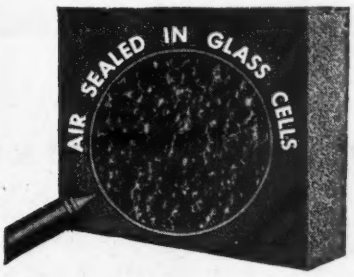
PC Foamglas licks tough insulating problems on roofs, in walls and floors. The big, oblong blocks are light in weight, easy to handle, but still rigid, strong and durable. PC Foamglas stays where it is laid. It does not creep, slip, pack down or powder.

In all sorts of plants all over the country, wherever conditions are really tough, PC Foamglas does an efficient job. It helps to maintain temperature levels, to minimize condensation.



Here you see PC Foamglas being laid. Later the specified built-up roofing will be applied and finished with a gravel surface. The PC Foamglas cant strips can be seen along the parapet wall at the right. Architect: E. Brielmaier & Sons Co., 735 N. Water St., Milwaukee, Wis.





Makeshift wooden cant strips have long been a source of roofing trouble. Now you can get cant strips made of PC Foamglas. You need not fear that they will check, swell, shrink or rot.

PC FOAMGLAS *Waterproof Fireproof* **INSULATION**

T. M. REG. U. S. PAT. OFF.

You will find a lot of worthwhile information on the use of PC Foamglas insulation for specific purposes in our authoritative, illustrated booklets. Send in the convenient coupon for your selection of *free* copies. Pittsburgh Corning Corporation. Room 400, 632 Duquesne Way, Pittsburgh 22, Pa.

Pittsburgh Corning Corporation
Room 400, 632 Duquesne Way
Pittsburgh 22, Pa.

Please send me, without obligation, your free booklets on the use of PC Foamglas Insulation for:

Roofs_____ Walls_____ Floors_____

*Address*_____

*Name*_____

*City*_____ *State*_____

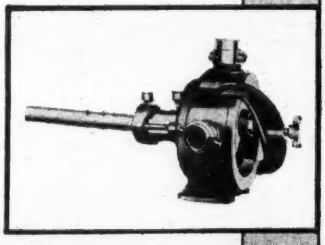
Recent National Pump Survey Shows:

Viking TOPS ROTARY PUMP FIELD

IN A recent national survey, Viking Rotary Pumps led the rotary pump field in popularity and widespread use. Vikings topped the field, being encountered 29.1% of the time among 17 makes of rotary pumps listed.

There is a reason for this popularity. Vikings place first because of their extremely simple design ... their rugged construction ... their record of dependable performance. Thus throughout the years they have earned their place as leader in the rotary pump field.

For complete information about Viking Rotary Pumps, write today for bulletin series 46S. It will be sent to you free by return mail.



See Our Catalog In SWEETS

VIKING Pump COMPANY
CEDAR FALLS, IOWA

The ONLY Successful OIL and GREASE RESISTANT MATTING

Neo-Cord Counter-Tred

Contains no rubber
Made with Dupont Neoprene

TUF-TRED TIRE FABRIC MATTING

A long-wearing mat that provides comfort and promotes safety in wet areas. Beveled nosing on all sides. ⅝" thick, up to 6' wide, any length.

AMERICAN COUNTER-TRED MATTING

A long-wearing rubber and cord matting with a resilient non-slip surface that affords safety in wet or slippery areas. Promotes sanitation. Ridged bottom affords aeration and drainage. Easily handled for cleaning. Keeps the feet dry. ⅝" thick, 24" wide, any length.

AMERIFLEX Hardwood Link MATTING

Links are held on galvanized steel springwire framework. Lies flat. Follows contour of the floor. Beveled edges. Can be rolled or folded.

Write for prices and folder, "A Mat for Every Purpose", describing matting for promoting safety, providing comfort, reducing fatigue and furthering sanitation.

AMERICAN MAT CORPORATION

"America's Largest Matting Specialists"

1797 Adams Street • Toledo 2, Ohio

nuts are fed to the upper end of inclined, rotating blanching rolls, arranged in pairs and covered with sandpaper or other abrasive material. The feed of peanuts is regulated by gates and baffles so that the operation is complete when the nuts have transversed the length of the rolls and discharged onto an inspection belt. Chaff and broken bits of nuts fall beneath the rolls into a compartment from which chaff is exhausted by a fan, and the nut particles recovered in a hopper below a vibrating screen.

Digest from U. S. Patent 2,405,292, issued August 6, 1946, on an application dated January 24, 1944, to H. P. Curlee, Charlotte, N. C.

VITAMINS

Ascorbic Acid and Carotene in Dehydrated Peaches

VIRGINIA-grown Elberta peaches were used in experiments to test methods of sulfuring and dehydrating, storage temperature and retention of dry matter. The peaches were halved, mixed, divided into lots and steamed before sulfuring by two methods: SO_2 fumes and Na_2SO_3 solution. Samples were dehydrated in an Eheart and Sholes dehydrator at temperatures of 140 to 150 deg. F. for about 22 hours, or until they became pliable and leathery. The dehydrated fruits were placed in tightly sealed jars and stored at 42.1 and 75.1 deg. F.

Moisture content of the fruit was quite low, 10.5 percent, and did not change during storage, but was affected by the length of time between harvest and dehydration. The method of sulfuring affected the moisture content; sulfuring with SO_2 fumes gave products of higher moisture content.

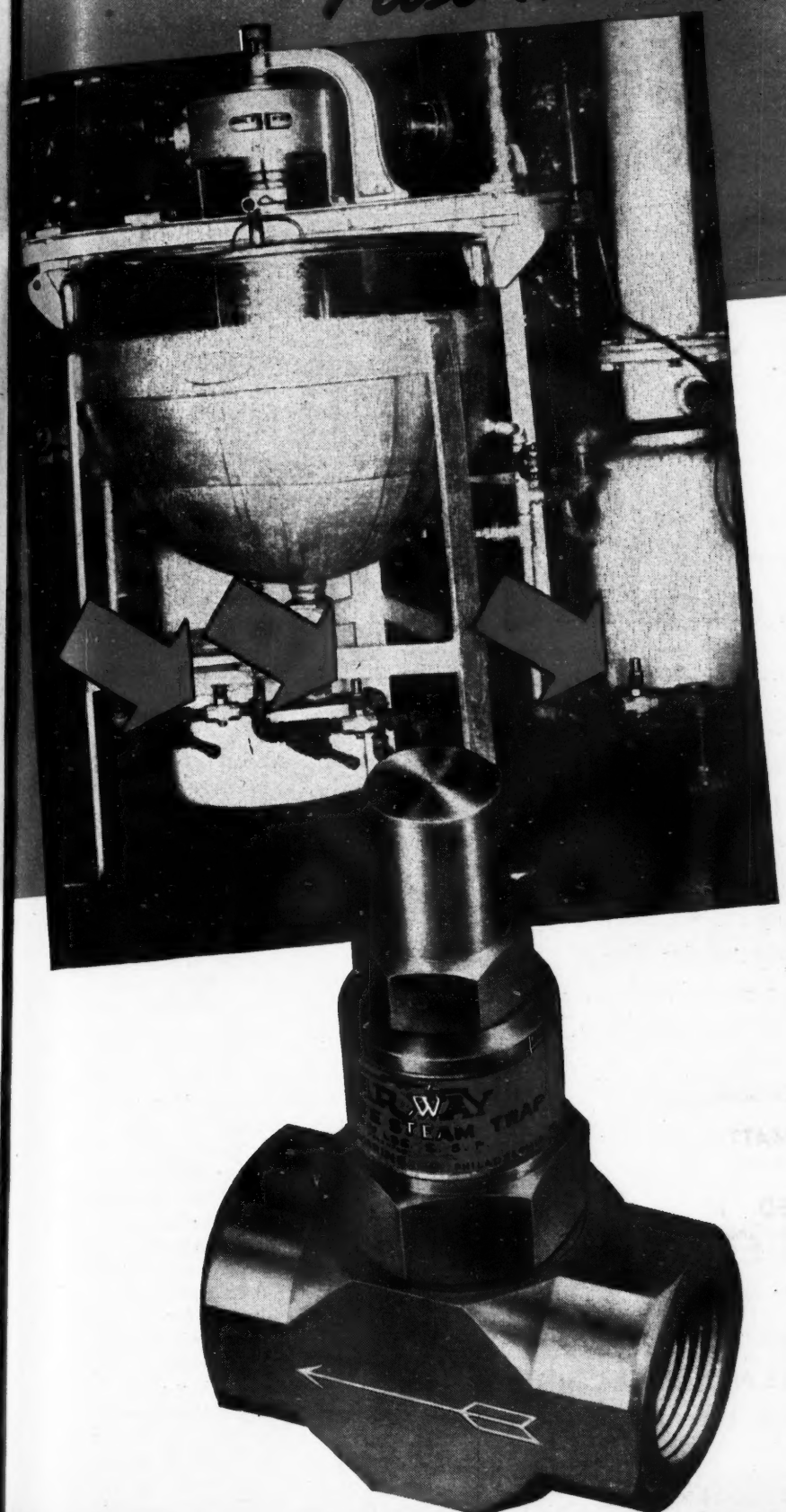
Immediately after sulfuring the peaches were higher in ascorbic acid than fresh peaches. After dehydration the unsulfured peaches were lowest in ascorbic acid, 0.025 mg. per g. SO_2 fumes were better than Na_2SO_3 solution, 0.116 mg. to 0.061 mg. Steaming prior to sulfuring made no difference in losses. Storage for six months at refrigerator temperatures increased the ascorbic acid, for reasons that are not understood, but similar increases have been observed in other dehydrated products stored at low temperatures.

Carotene content of dehydrated peaches was affected by storage time after harvest and before dehydration, but not by sulfuring methods. Peaches stored at re-

YARWAY TRAPS HELP

"Pass the Apple Butter"

FASTER!



Three little Yarway Impulse Steam Traps do a big job on this steam jacketed kettle, shortening cooking time in the production of apple butter and other fruit products.

The scene is a pilot plant operation at the Eastern Regional Research Laboratory of the Department of Agriculture . . . but the results are the same wherever steam equipment is used. From all corners of the country comes the report—*Yarways get steam equipment hotter, sooner and keep it hot!*

That's because Yarway Impulse Traps discharge *continuously* under heavy loads, while equipment is being brought to operating temperature. Then, under lighter loads, they discharge at short intervals, maintaining peak efficiency.

Other important Yarway advantages are small size, easy maintenance (only one moving part), broad pressure range and low cost.

Try a Yarway today . . . standardize on Yarways tomorrow. See your nearest Mill Supply dealer, or write for Yarway Bulletin T-1739.

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

Yarway Traps are made and sold in Canada and Great Britain

OVER 500,000 ALREADY PURCHASED!

YARWAY IMPULSE STEAM TRAP

4 machines in one efficient unit

Our various customers fill more than 150 different kinds of materials on the Universal Filler . . . Drugs . . . Cosmetics . . . Foods . . . and other household products. Powders and pastes and free-flowing materials—products which must be packed and crowded into the container; products which must be handled gently, without pressure. (In fact, everything but solids and liquids). And, so versatile is this Filler that one customer fills 38, another 31, and another 24 *different kinds of materials on one machine!*

Fills practically any kind of container with almost any kind of material!

STOKES & SMITH Co

4911 Summerdale Ave., Philadelphia 24, U. S. A.

FILLING : PACKAGING : WRAPPING MACHINES

Speeds to suit your needs—15-30-60-120 per hour

"Better machines for better packages"

frigerator temperatures contained 29.6 mcg. of carotene per g. against 25 mcg. for storage at room temperature. The total losses of carotene in dehydration are large—fresh fruits contain about 75 mcg. per g. against an average of 31.6 mcg. for the dehydrated samples.

Digest from "Effects of Method of Sulfuring, Dehydration, and Temperature of Storage on Ascorbic Acid and Carotene Content of Dehydrated Peaches," by M. S. Eheart and M. L. Sholes, *Food Research*, Vol. II, 332-340, July-August, 1946.

MISCELLANEOUS

Tasting Panels

QUALITY judgments of food stuffs by tasting panels are either of the "grading" type, in which an absolute assessment of preference is sought, or the "analytical" type, where the effect of new or modified processes are compared. In the former, the panel should be a representative sample of the general consuming public, while on the latter maximum sensitivity is desirable.

Before making up a panel, individuals composing it should be tested to determine threshold sensitivity to the four primary tastes of sweet, sour, salt and bitter. There are persons lacking ability to distinguish salt from sweet, and bitter from sour, at low concentrations.

When the four simple tastes are combined with other gustatory effects, as in the taste-testing of scrambled eggs, only the higher concentrations of the added test substances (sucrose, caffeine, glutamic and tartaric acids, and sodium chloride) were detected with any consistency. Furthermore, there was no significant association between threshold values for the simple tastes and their scoring of egg samples containing the test substances. This is due to the fact that taste perception is only one factor entering into palatability judgments.

When quality is assessed on a numerical scale such as 0 to 10, individual ratings tend to become more erratic on low-scoring products. As a result the number of judges required to produce statistically significant data increases.

Individual members of a panel may be evaluated for their usefulness in judging food products, by calculating the correlation and regression coefficients of their score, with respect to the average scores of the panel, and the average deviations from the scores of all the others on the panel. A member

what's your need in SIZE?

Globe supplies seamless and welded stainless steel tubing ranging from an outside diameter less than that of an average lead pencil — ⅛ inch — up to 6 inch outside diameter (Iron Pipe Size).

Thick-walled, seamless pressure tubes in carbon and alloy steels from ½ inch up to 6⅝ inch outside diameter for huge boilers in utility and industrial power plants are supplied by Globe, as well.

Your tubing needs may lie somewhere between these two extremes — whatever your requirements, standard or special in a wide range of sizes, shapes, and analyses, Globe is qualified by experience and facilities to supply you with tubing of the quality and uniformity you demand.

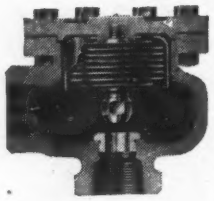
GLOBE STEEL TUBES CO., Milwaukee 4, Wisconsin

GLOBE TUBES

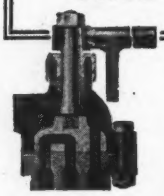
★ STAINLESS STEEL TUBES ★ PRESSURE TUBES ★ GLOBEIRON TUBING ★ GLOWELD TUBES
★ CONDENSER AND HEAT EXCHANGER TUBES ★ MECHANICAL TUBING

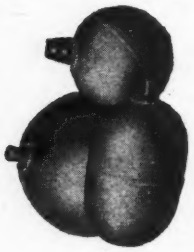
5025

Why Standardizing on Nicholson Specialties will...



PROMOTE ECONOMY AND EFFICIENCY

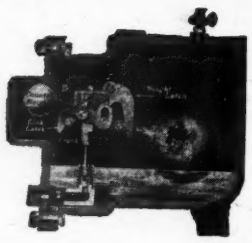




Catalogs on Request or

SEE OUR CATALOG IN SWEET'S

By providing a *single* source of technical information on units with such varied applications as traps, floats and control valves, your Nicholson service engineer can save you time in solving specification and maintenance problems. His ability to furnish a standard or special unit for every process and power purpose solves supply problems. Should you not know your Nicholson service engineer let us name him. W. H. NICHOLSON & CO., 193 Oregon St., Wilkes-Barre, Pa.



for • SPRAYING
• WASHING
• RINSING
• COOLING
• AIR CONDITIONING

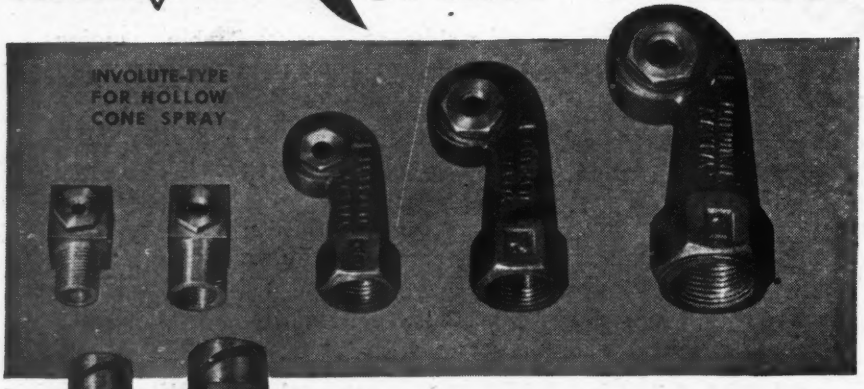
Get the most out of your Spraying Equipment with minimum power... with efficient spraying.

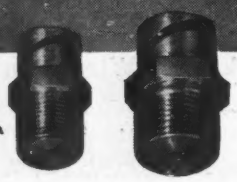
Use Yarway Nozzles. No internal vanes or other restrictions to clog or hinder flow. Two types—Yarway Involute-type producing a fine hollow spray with minimum energy loss, and Yarway Fan-type producing a flat fan-shaped spray with time-saving slicing action for cleaning.

Wide range of standard sizes and capacities. Cast or machined from solid bar stock.

Thousands in use. Write for new Bulletin N-616.

YARWAY SPRAY NOZZLES





FAN-TYPE FOR FLAT SLICING SPRAY

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

with a coefficient close to unity and only a small deviation from the average preference level is obviously a good choice.

Digest from "Precision of Assessment of Palatability of Foodstuffs by Laboratory Panels," by J. W. Hopkins, *Canadian Journal of Research*, vol. 24 F, 203-214, July, 1946.

Health of Dairy Cows Unaffected by DDT

DDT IN silage, made from field-dusted pea vines, apparently has no effect upon the health of dairy cows, and upon the consumers of their milk and meat.

Pea vines were stored in two silos. DDT was added, at the rate of 1 lb. per ton to the vines in one silo, while the other lot, serving as a control was ensiled without DDT.

A group of 5 dairy cows were fed the treated silage at the rate of 3 lb. per 100 lb. live weight, with clover hay and a 16 percent protein concentrate. Blood and milk samples were taken frequently. Milk was fed to rats to test for toxicity.

Three cows received the treated silage for 118 days, one for 141 days, and the fifth was slaughtered after 127 days. One cow dropped a heifer calf after 67 days. This calf received milk from the treated group for 75 days. A second cow gave birth to a bull calf after 102 days. It was slaughtered after 33 days. A third calf, born to a cow fed the control silage, was given milk from the cows fed treated silage from the time it was 33 days old.

None of the animals showed evidence of toxic effects from the DDT. The calcium, carotene, vitamin A, ascorbic acid and hemoglobin levels of the blood were not affected. Rats fed milk from the cows on treated silage as their sole diet, grew as well as those fed milk from control cows, and showed no symptons of DDT poisoning.

Milk, from the cows fed treated silage, contained 15.6 ppm. of DDT near the close of the experiment. Analysis of the tissue of the slaughtered animals indicated 3.8 ppm. in the muscle tissue, 6.1 ppm. in the liver and 221 ppm. in the depot fat of the cow, while the calf had 3.1, 6.2 and 305 ppm. respectively, for the corresponding tissues.

A small lot of silage was available from a field-dusted experimental field. This was found to contain less than 1 ppm. DDT.

Digest from "The Effect of Ingestion of DDT upon Dairy Cows," by N. N. Allen, H. A. Lardy and H. F. Wilson, *Journal of Dairy Science*, vol. 29, No. 8, 530-531, August, 1946.

BOOKS

Efficient Lighting

FLUORESCENT MANUAL. Published by Sylvania Electric Products, Inc., Salem, Mass., 1946. 5x8 in.; 78 pages; paper. Price, $1.00.

This is actually a service manual that illustrates how to both maintain and conserve fluorescent equipment. It shows how to spot danger signals, how to estimate replacements, what factors affect lighting performance and has many other suggestions for keeping maximum lighting efficiency at minimum cost. production and in numbers of hens and pullets.

Official statements in support of the department's recommendations indicate immediate resistance to the proposals by the farmers, most of whom remember what happened after the last war when foreign demand dried up overnight.

Going Up

DEVELOPING YOUR EXECUTIVE ABILITY. By Howard Smith. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y., 1946. 5½x8 in.; 222 pages; cloth. Price $2.50.

This is a serious attempt to put into words the attributes of character that enter into the development of a successful executive. The book will be helpful to those who have already achieved a merited executive status as well as those who are eager to put forth the effort necessary to climb. Those who are content to ride along as they are might as well ignore this book.

Research Directory

INDUSTRIAL RESEARCH LABORATORIES OF THE UNITED STATES, eighth edition. Compiled by Callie Hull. Published by National Research Council, National Academy of Sciences, Washington, D. C. 7x10 in.; 415 pages; cloth. Price, $5.00.

Food plant executives, as well as the technologists interested in research, must keep acquainted with the industrial research activities of the country. The ideal aid in that effort is now available in this volume, which presents an up to date directory showing ownership, location, and the principal personnel of industrial research laboratories. The volume is a splendid demonstration of the rapid growth even during the war period of industrial research having peace objectives. And the bulk of these groups which turned to war projects in a patriotic manner are now back seeking new industrial opportunities for their firms. One who wishes to know his potential competition of a few years hence can well study the pages of this directory.

More on DDT

DDT AND THE INSECT PROBLEM. By James C. Leary, William I. Fishbein, and Lawrence C. Salter. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y., 1946. 5½x8 in.; 164 pages; cloth. Price $2.50.

DDT, shorn of the super duper and ill founded early claims made for it, remains one of the most valuable developments of World War II. Just what it is and what are some of its most effective applications, are set forth in this timely little, and easily read volume. Of equal importance is the revelation of some of the things DDT will not accomplish.

Nutrition Guide

NATIONAL FOOD GUIDE, AIS—53 AND THE BASIC SEVEN WALL CHART. U. S. Department of Agriculture, Washington 25, D. C. Free.

These are revised versions of the nutrient requirements, showing the approximate amounts of the various food groups required per day. They are being used principally as a teaching device, though they should prove useful as a convenient reference anytime daily food needs are under discussion.

Food Economics

FOODS: THEIR VALUES AND MANAGEMENT. By Henry C. Sherman. Published by Columbia University Press, Morningside Heights, New York, N. Y., 1946. 5½x8½ in.; 198 pages; cloth. Price $3.25.

Conceived as a companion to "The Science of Nutrition," this book deals with the larger aspect of foods—their production and supply in relation to their nutritional value and their economic efficiency. A chapter is devoted to each of ten food groups: Grain crops, mature legumes and nuts, potatoes and sweet potatoes, green and yellow vegetables, citrus fruits and tomatoes, other fruits and vegetables, milk and its products, meats, fish, poultry and eggs and food fats,

IMPROVE QUALITY BY SPEEDING UP COOKING TIME . . . . . PLUS

FUEL SAVINGS TO 20%

TIME SAVINGS TO 28%

LOWER LABOR COSTS TO 22%

By speeding up cooking time through the use of the Cochrane C-B System, manufacturers have not only improved the quality of their products but have effected tremendous savings.

We have letters on file from manufacturers telling of production increases up to 61% —fuel savings up to 20%— time savings to 28%—lower labor costs to 22%—made possible by the installation of the C-B System of High Pressure Condensate Return—a system that drains condensate from process equipment and returns it to the boiler at practically the same pressure and temperature as when it left.

Write for a copy of Publication No. 3250

COCHRANE CORP.
3117 N. 17th Street
PHILADELPHIA 32, PA.

COCHRANE C-B SYSTEM

CONDENSATE RETURNED TO BOILERS AT HIGH PRESSURE AND HIGH TEMPERATURE

MORE PROFITS THROUGH *Scientific* CHEMICAL RESEARCH

TRUESDAIL offers clients a thoroughgoing scientific chemical knowledge, supplemented by years of experience with many type of research and quality control problem, that adapts Truesdail Service to local and national needs.

You can depend on Truesdail for specialized research and consultation . . . for *Science with a Sales Slant!*

A request on your company letterhead will bring a copy of our new booklet entitled "More Profits With Chemistry".

PRODUCT FORMULATIONS
PROCESSING AND EQUIPMENT DESIGN
BY-PRODUCT UTILIZATION SURVEYS
LABELING AND ADVERTISING COUNSEL
LEGAL TESTIMONY
PLANT QUALITY CONTROLS

TRUESDAIL LABORATORIES, INC.
Chemists and Bacteriologists
520 WEST AVENUE 26 • LOS ANGELES 31, CALIFORNIA

MEMBERSHIPS
ASSOCIATION OF CONSULTING CHEMISTS *and* CHEMICAL ENGINEERS, INC.
Roger W. Truesdail, Ph. D., President
C. E. P. Jeffreys, Ph. D., Director of Research
AMERICAN COUNCIL OF COMMERCIAL LABORATORIES

SPECIAL FACILITIES FOR FOODS

NEED CONVEYOR BELTS?

Try one of CYCLONE'S 3 types

BECAUSE we make *three* types of metal conveyor belts in a wide variety of metals, alloys and finishes, our recommendation of a U·S·S Cyclone belt for your job is *unbiased.* Our 25 years' experience in making metal belts for industrial uses has given us a wealth of practical information. Our reputation for quality and dependability is unsurpassed.

When you begin to plan a new conveyor belt system, call the nearest Cyclone office. Or write for our free catalog #3. Offices are located in principal cities . . . factories in the Midwest and on the Pacific Coast.

Made by the makers of Cyclone Fence
CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Dept. H-17, Waukegan, Illinois
United States Steel Export Company, New York

CYCLONE FENCE DIVISION · American Steel & Wire Co.
USS CYCLONE "Red Tag" METAL BELTS
UNITED STATES STEEL

UNITED STATES STEEL

sugar and sweets. There is also a concluding consideration of food adjustment to fit the national food supply to the newer knowledge of food requirements.

GOVERNMENT PUBLICATIONS

The following recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated the pamphlet is free and should be ordered from the bureau responsible for its issue.

DAIRY AND POULTRY MARKET STATISTICS, 1945. Department of Agriculture, Production and Marketing Administration. Price 25 cents.

MILK PRODUCTS: COSTS, PRICES, AND PROFITS OF WAR FOOD PURCHASES. Department of Agricultures, Production and Marketing Administration. Multilithed.

LIVESTOCK, MEATS, AND WOOL MARKET STATISTICS AND RELATED DATA FOR 1945. Department of Agriculture, Production and Marketing Administration. Multilithed.

AGRICULTURAL OUTLOOK CHARTS FOR 1947. Book 1. Department of Agriculture, Production and Marketing Administration. Multilithed.

DIRECTORY OF THE MEAT INSPECTION DIVISION. Department of Agriculture, Production and Marketing Administration. Price 15 cents.

COLORIMETRIC PHOSPHATE TESTS FOR BOILER WATERS CONTAINING TANNIN. Bureau of Mines, Report of Investigations, R. I. 3983. Mimeographed.

REDUCTION OF LOSS AND DAMAGE IN RAIL TRANSPORTATION OF FRESH FRUITS AND VEGETABLES BY IMPROVED LOADING METHODS. By Philip L. Breakiron. Department of Agriculture, Bureau of Agricultural Economics. Processed.

UNITED STATES STANDARDS FOR GRADES OF CANNED ORANGE JUICE (effective November 15, 1946). Fourth issue. Department of Agriculture, Production and Marketing Administration. Mimeographed.

FEDERAL SPECIFICATIONS. New or revised specifications which make up Federal Standard Stock Catalog have been issued on the following items: Pears; Evaporated (or Dried) Z-P-206a. Pineapples, Fresh Y-P-381a. Price 5 cents each.

PATENTS

ENGINEERING

Dehydrating Unit Designed to Consist Primarily of Combination Pressure Sealed Furnace and Drying Chamber With Elongated Passageway for Air and Materials to be Dried—Wilburn W. O'Neal and Robert D. Williams, Memphis, Tenn. No. 2,409,787. Oct. 22, 1946.

Dough Masses Divided Into Pre-Determined Weight Units by Adjustable Mechanical Means—Harry Whalley Bowker, to Baker-Perkins, Ltd., Peterborough, England. No. 2,408,602. Oct. 1, 1946.

Finely Divided Materials Discharged From Feeder Receptacle Under Automatic Control—Jacob L. Michel to Bluhill Foods, Inc., Denver, Colo. No. 2,408,221. Sept. 24, 1946.

Foods Quick-Frozen on Low Production Capacity Plate Freezers—Andrew J. Stone, New York, N. Y. No. 2,408,154. Sept. 24, 1946.

Glycerin Made by Fermentation of Sugar With Yeast—Carl A. Neuberg, New York and Irene S. Roberts, Fieldston, N. Y. No. 2,410,518. Nov. 5, 1946.

Grain Cleaned by Abrasive Action of Rotor Operating in Horizontal Plane—Lawrence E. Egedal, Milwaukee, Wis. No. 2,405,561. Aug. 13, 1946.

Grains Mechanically Freed From Weed Seed and Graded According to Grain Size During Passage Through Plurality of Duplicate Rotatable Screens—Walter Earl Dempsey, Moose Jaw, Saskatchewan, Canada. No. 2,407,653. Sept. 17, 1946.

Milk-Containing Food Prepared by Freezing Ingredients to Solid Mass, Comminuting, Mixing and Impregnating in Mixing Zone With Gaseous Material Under Super-Atmospheric Pressure to Impart Flowable Property Preliminary to Releasing Pressure to Atmospheric Level—Claude A. Reed, Omaha, Nebr. No. 2,409,067. Oct. 8, 1946.

Citrus Fruits Given Surface Mechanical Treatment to Open Oil Cells, Submerged in Weak Acid Solution to Convert Protopectin of Peel to Pectin, Washed in Clear Water to Remove Excess Acid, Cut to Desired Size and Thickness and Cooked With Additional Sirup, Sugar and Pectin to Make Marmalades, Jams, Preserves—Otto J. Steinwand, Redwood City, Calif. No. 2,407,801. Sept. 17, 1946.

PACKAGING

Bread Loaves Protected by Banded Packaging—Ap Trevor Jones, Chicago, Ill. to Interstate Bakeries Corp., Kansas City, Mo. No. 2,408,317. Sept. 24, 1946.

Moisture Resistant Paper Wrapping Given Anti-Fungus Properties by Incorporation of Dialkyl Dichloro-Succinate in Coating—George C. Borden, Jr. and Karl R. Karlson, Easton, Pa., to Riegel Paper Corp., New York, N. Y. No. 2,406,990. Sept. 3, 1946.

STARCH AND SUGAR

Starch in Dry State Bleached and Sterilized by Action of Activated Soluble Inorganic Chlorite in Presence of Acid in Non-Liquid State—George Paul Vincent, Poughkeepsie, N. Y. to Mathieson Alkali Works, Inc., New York, N. Y. No. 2,409,084. Oct. 8, 1946.

Starch in Water Suspension Treated With Water Soluble Urea-formaldehyde Condensation Products and Water Soluble Melamine - formaldehyde Condensation Products to Impart Thick Pasting Property—Lowell O. Gill and John W. McDonald, to A. E. Staley Mfg. Co., Decatur, Ill. No. 2,407,071. Sept. 3, 1946.

Sugar Content of Solutions Determined by Continuous Method—Paul W. Alston, Berkeley and Erwin E. Morse, Woodland, Calif. No. 2,408,900. Oct. 8, 1946.

VITAMINS

Alkyl Ether Derivative of Vitamin D Prepared as New Product—Nicholas A. Milas, Belmont, Mass. to Research Corp., New York, N. Y. No. 2,410,893. Nov. 12, 1946.

Riboflavin Solubility in Water Increased by Adding Water Soluble Alkali Metal Salt of Gallic Acid—John Cecil Bird, Pleasantville and Andrew Kuna, Douglaston, N. Y. to William S. Merrel Co., Cincinnati, Ohio. No. 2,407,624. Sept. 17, 1946.

Vitamin D Made by Activating Mixture of Sterols Including Addition of Provitamin D From Mussels as Step in Adjusting Provitamin D Content of Sterol Mixture Under Treatment—James Waddell, Metuchen, N. J. and Warren W. Woessner, Wilmington, Del. to E. I. du Pont de Nemours & Co., Wilmington, Del. No. 2,410,254. Oct. 29, 1946.

MISCELLANEOUS

Clear Colorless Pectase Extract Prepared from Growing Legumes—Herbert T. Leo and Clarence C. Taylor, Anaheim, Calif. No. 2,406,840. Sept. 3, 1946.

Fresh Water Fish Heat-Treated in Boiling Water Preliminary to Cleaning and Dressing for Canning—Armin R. Kleinschmidt, Mankato, Minn. No. 2,411,736. Nov. 26, 1946.

Milk Pasteurized With Minimum Formation of Froth—Huldreich Egli, Baltimore, Md. No. 2,411,681. Nov. 26, 1946.

Roasted Coffee Subjected to Infra-Red Rays at Less Than 200 Deg. F.—Bartlett H. Stafford Chappell, Hurley, N. Y. No. 2,410,427. Nov. 5, 1946.

BASIC FLAVOR MATERIALS

FOR FOOD PRODUCTS MANUFACTURE

Solid Extracts

ST. JOHNS BREAD
SWEET ORANGE PEEL
LICORICE
FOENUGREEK
KOLA
MAPLE BASE
COFFEE

Oleoresins

CAPSICUM
GINGER
PAPRIKA
PARSLEY SEED
TONKA

ESSENTIAL OILS • AROMATIC CHEMICALS • SPICES
GUMS: TRAGACANTH, ARABIC, KARAYA, LOCUST

S. B. PENICK & COMPANY
50 Church Street, New York 7, N. Y. Telephone: COrtlandt 7-1970
735 W. Division St., Chicago 10, Ill. Telephone: MOhawk 5651

So you think **HE'S** *fast!*

Just because a guy can run 100 yards in less than 10 seconds, you compare him to a flash of lightning. Listen a minute, while we tell you about a *salt* that's fast . . . and why it's important to you.

In salting butter, salt must dissolve with lightning speed. If the butter is on the soft side, butter salt must dissolve so quickly that overworking is avoided. Otherwise, the butter may become mottled or marbled, lose its moisture, become leaky. Yet, if the salt is not properly dissolved, the butter may be gritty. So, remember that Diamond Crystal Butter Salt dissolves completely in water at 65° F. at an average rate of 9.2 seconds.

On the other hand, there are instances where slow solubility of salt is highly important . . . such as in salting cheese. Here slow solubility prevents salt being lost in whey, producing undersalted cheese. To meet *all* these problems, we have set up definite solubility standards for Diamond Crystal Salt.

Need Help? Write for It!

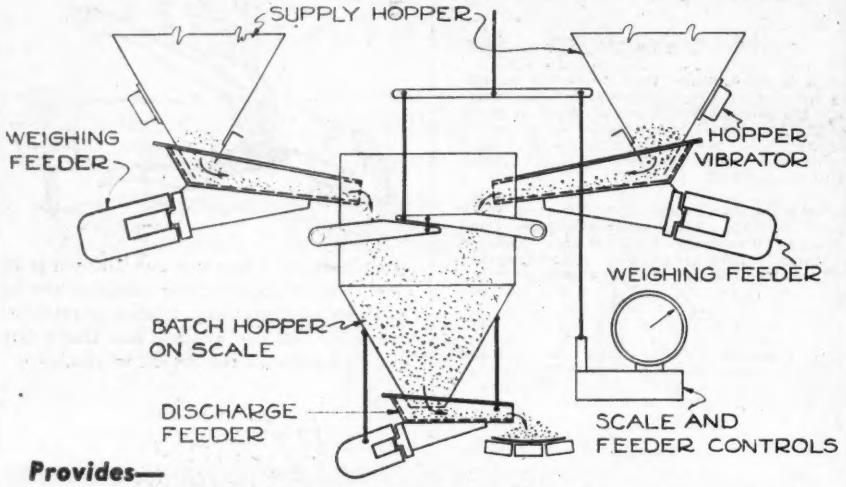
If salt solubility enters into your processing, write to our Technical Director. He'll gladly recommend the correct grade and grain of Diamond Crystal Salt for best results. Diamond Crystal, Dept. J-15. St. Clair, Michigan.

DIAMOND CRYSTAL
Alberger PROCESS SALT

SYNTRON

"Automatic"

BATCH WEIGHING



Provides—

Accuracy of Batch — Simple Control — Selectivity

Syntron Vibratory Feeders interlocked with scale control permit the handling of any one, or a combination of any number of materials to be accurately and automatically batched at the same time.

Write us about your problem.

SYNTRON CO., 460 Lexington, Homer City, Pa.

This Modern Miracle in Food Belting

PlasTex

Can Solve Your Food Conveying Problem

Here it is! A fully pliable plastic coated belting that is impervious to oils, greases, acids, alkalis and moisture—PlasTex belting. Now you can convey hot or cold, wet or dry substances of every nature—month after month on this remarkable belting—it won't pick up or give off odors—it will clean more easily—and last many times longer than uncovered belting.

Famous "Buffalo" Quality

Beneath the protective plastic coating is time-honored Buffalo solid woven cotton carcass, proved in use for over half a century. Join the hundreds of leading food processors already enjoying the benefits of PlasTex belting in their plants.

Write for sample and the name of your nearest supplier.
DEPT C

BUFFALO WEAVING & BELTING COMPANY
Chicago Buffalo 7, N. Y. New York
Serving Industry for Over Fifty Years

Plant Revitalization

(*Continued from page 85*)

4. (PM, T; PM, T) Develop, design and test "new" equipment.

5. (PM, T; PM, T) Design connecting and materials handling equipment:
   (a) Product piping
   (b) Mechanical transfer of product
   (c) Units in which product is handled (buckets, carts, etc.)
   (d) Continuous flow (continuous or repetitively intermittent) conveying.

6. (PM, T; PM, T) Select and/or design product control equipment:
   (a) Temperature controls
   (b) Volume controls
   (c) Cycle controls
   (d) Safety controls
   (e) Pressure controls
   (f) Speed controls
   (g) Counters.
   (h) Others.

7. (PM, T; PM, T) Assemble detail of 4, 5, and 6, above, "into" 3 above.

8. Design and detail for and "into" 3, above, service connections, e. g., steam, power, water, etc.

9. (PA; PA) Place orders for equipment (as found expedient).

F. Installation and Operation

1. (PM; PM) Select appropriate period for "cutting in" new line.

2. (PM; X) Set up work schedule:
   (a) Area preparation
   (b) Unit Installation.

3. Prepare services (power, steam, etc.)

4. Set up and use detailed progress of job, having established possible alternates. Gantt chart preferred.

5. (PM, T; PM, T) Trial operation—not for production—of *each* unit in line.

6. Initial clean up. (Removal of tools, assembly equipment, etc.).

7. (T; T) Clean product, bearing or contact surfaces, and inspect.

8. (PM, T; PM, T) Initial operation for production.

9. (PM; PM) Training production personnel.

10. (PM; PM) Establishing maintenance standards.

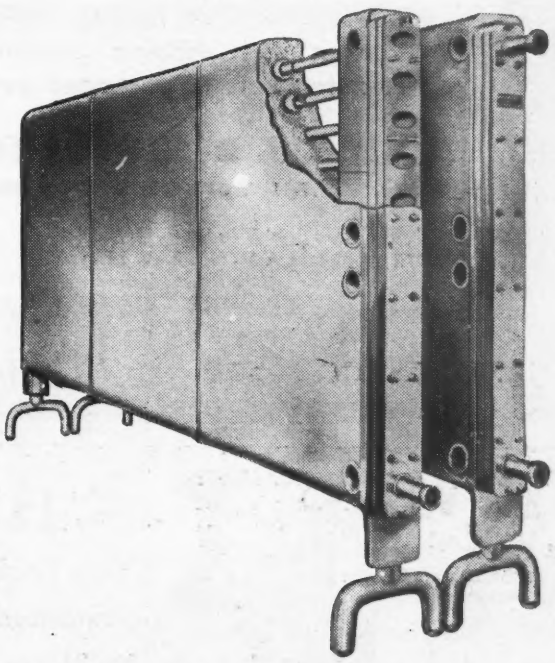
11. (T; T) Release to production department.

Follow these steps, omit none unless assured it does not exist, and the line operation resulting will be a smoothly operating one, well engineered to meet postwar expectations, rather than mere restoration of prewar plant facilities.

You get FAST HEATING & COOLING FULL CORROSION RESISTANCE with *Carpenter* Stainless Tubing

● The *uniform walls* of this Stainless Tubing allow you to use gauges that give you faster heating and cooling. And this same uniformity helps to speed fabrication.

On your jobs where you need full corrosion and heat resistance, specify 100% hydrostatically tested Carpenter Stainless Tubing. You'll find it pays—from first cost to less "down time" for tube repairs and replacements. Drop us a line and make use of Carpenter's long experience with Stainless Tubing problems.



On your jobs where sanitary requirements are rigid you'll find this tubing easy to clean and keep clean.

Easy fabrication is one advantage you get because of this tubing's uniform walls. Coil made from 1" IPS Carpenter Stainless Tubing—Type 316.

POLISHED INSIDE *Carpenter* Stainless Tubing

To guard against carry-overs from one process to another, and protect against product contamination, Polished Inside Carpenter Stainless Tubing is often used in food, dairy and chemical production. Available in a wide variety of sizes and analyses.

CARPENTER STAINLESS TUBING for
—Strength and Rigidity
—Weight Savings
—Corrosion Resistance
—Heat Resistance
—Accuracy
—Fabricating Savings
—Longer Service Life
—Sales Appeal

THE CARPENTER STEEL COMPANY • Welded Alloy Tube Division • Kenilworth, N. J.

Carpenter
STAINLESS TUBING

Design for Food Packaging

• Can we help you plan the packaging for the new products you are going to bring out — or restyle and modernize the packaging of your present products? . . . Our Design and Sample Department is now doing much forward work on Folding and Display Cartons and Shipping Containers for manufacturers of packaged goods. •

HUMMEL & DOWNING COMPANY
MILWAUKEE 1, WISCONSIN

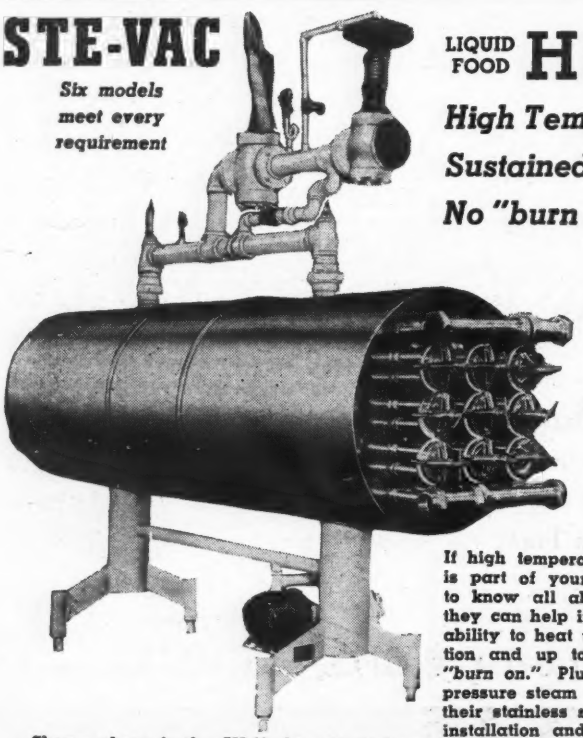
WASTE PAPER IS A VITAL RAW MATERIAL . . . SAVE IT . . .

STE-VAC

Six models meet every requirement

LIQUID FOOD **HEATERS**

High Temperatures
Sustained Heating
No "burn on"



- 5,000 to 40,000 lbs. per hour capacity
- Quickly adapted to practically any liquid food heating operation.

If high temperature processing of liquid foods is part of your plant operation, you'll want to know all about Ste-Vac Heaters and how they can help increase production. About their ability to heat up to 190° in one stage operation and up to 240° in two stages—*without* "burn on." Plus their utilization of dry, low-pressure steam under self-acting controls. Plus their stainless steel construction, their ease of installation and the many other Ste-Vac features which make them readily adaptable to your plant and product, and assure you of maximum heating efficiency.

There's a Ste-Vac Heater for your particular needs. Write for detailed information and specifications.

Shown above is the SV-40, largest of the Ste-Vac Heaters. Its 48 tubes, each 10' in length, can handle up to 40,000 lbs. of liquid food products per hour. Floor space required: 40" x 11'6". Shipping weight: 3800 lbs.

Designers and manufacturers of foods handling equipment since 1899.

CHESTER DAIRY SUPPLY CO.
5TH & TILGHAN STS. CHESTER, PENNA.

Sterilization

(*Continued from page* 100)

considered is the removal of steam by condensation. This occurs because of the utilization of heat energy in three ways: (1) in doing work during the expansion of the steam as it enters the mixture; (2) in heating and expanding the air; and (3) in heating objects with which the vapors come into contact.

Each of the three factors just described impedes uniform mixing of air and steam within a retort filled with small containers. Diffusion tends to bring about uniformity but, for reasons introduced by the three factors, and for other reasons, diffusion alone cannot accomplish it practically. Localized combinations that actually do satisfy equilibrium conditions, while each of the latter can contain saturated steam that is different than temperatures in other parts of the retort. The only internal influence tending to eliminate the variations is diffusion. In the face of such difficulties it seems that the only possibility of maintaining a uniform temperature throughout the retort in a steam-and-air-process must lie in a violent circulation of the vapors in the retort at all times. The circulation must be rapid enough to overcome all variations.

Part II, to appear in the February issue, will explore in detail the complex behavior of steam and air mixtures, and how heat is transferred from them to objects or food containers in such mixed atmospheres.

Part III, to be published in March, discusses High-Short Sterilization, and dielectric and high frequency heat processing. — The Editors.

—End—

Market Research

(*Continued from page* 97)

$1,300 to $55,000. Maximum annual expenditure per client has risen from $8,600 to nearly $600,000.

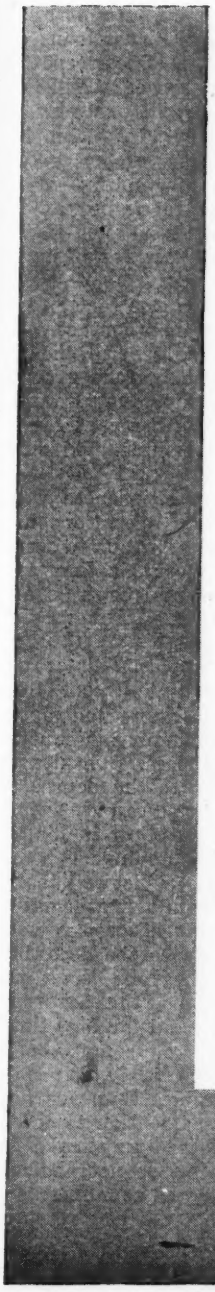
3. Countless expansions and improvements in technic have been made.

4. Operation of the service has been put on a highly mechanized, repetitive, quantity-production basis.

5. Operations have been extended to Canada and United Kingdom, with excellent prospects for early extension to other countries—thus making avail-

FOR THE PREVENTION OF BROWNING OF FROZEN FRUITS

ASCORBIC ACID-CITRIC ACID MIXTURE



As soon as a fruit is peeled or sliced, it is exposed to the action of atmospheric oxygen. The first result of this exposure is the oxidation of the ascorbic acid (Vitamin C) naturally present, and as soon as this has occurred certain substances also present are next attacked causing the development of a brown color. The rates at which these oxidations take place are also greatly increased by certain enzymes present in the fruit.

Since the ascorbic acid must first be oxidized before "browning" occurs, this latter can be postponed by adding additional quantities of the ascorbic acid and naturally the more that is added the longer "browning" is delayed, although with the enzymes present, to speed up the oxidation, it will eventually occur.

Experimental work carried out in the laboratories of Chas. Pfizer & Co., Inc., has demonstrated that by adding a small amount of citric acid to the fruit the enzymes, which cause rapid oxidation, are inactivated and only a relatively small amount of ascorbic acid need be added to protect cut or frozen fruits against "browning".

Chas. Pfizer & Co., Inc., now has available an ascorbic-citric acid mixture (4% ascorbic acid U.S.P., 96% citric acid anhydrous) which combines the enzyme-inactivating effect of the citric acid with the anti-oxidant effect of ascorbic acid to give better protection against the "browning" of frozen fruits *and at a lower cost.* For further information please inquire of Chas. Pfizer & Co., Inc., 81 Maiden Lane, New York 7, N. Y.; 444 W. Grand Avenue, Chicago 10, Illinois; 605 Third Street, San Francisco 7, Calif.

PFIZER QUALITY

PFIZER

Manufacturing Chemists Since 1849

ROCCAL, the germicide of tomorrow, is ready to go to work for you today. ROCCAL is a powerful germicide possessing many advantages over the sanitizing agents now in general use. ROCCAL is *safer* to use for sanitizing equipment or any surface that comes into contact with food or drink. ROCCAL kills bacteria! It inhibits growth of molds, slimes and algae.

In recommended dilutions, ROCCAL is non-poisonous, virtually odorless and tasteless. It is non-corrosive . . . will not injure metal or fabrics. It is non-irritating to operator's hands.

ROCCAL is accepted by leading public health authorities.

Mail coupon now for additional information and a sample bottle of the germicide of tomorrow.

COUPON *brings sample and literature*

Industrial Division, Winthrop Chemical Company, Inc.
1450 Broadway, New York 18, N. Y.

NAME.....

STREET.....

CITY.....STATE.....

W-17

INDUSTRIAL DIVISION

WINTHROP CHEMICAL COMPANY, INC.

1450 Broadway, New York 18, N. Y.

able to American producers a foundation of vital facts for their effective and economical invasion of foreign markets.

There is no doubt that marketing research has grown up, and that it now has the stature of a top-flight tool of progressive management. Even those who are not ambitious to make their businesses grow will need this essential tool of defense against the rapidly increasing number of their aggressive competitors who choose to employ marketing research as a weapon of offense.

While marketing research is so complex that the average executive cannot hope to be conversant with all details, most executives need a clearer understanding of certain key points on the subject:

1. Importance of accuracy and reliability of the basic data (from each home or store). If a questionnaire procedure is used, ask: Does respondent know the right answer? Will the respondent tell the right answer?

2. Representativeness of sample. Are all important types of homes (or stores) available for sampling—or if not, are reasonable facsimiles available? Is each element sampled in its proper proportion? Beware of mail samples.

3. Are the sample homes (or stores) made non-typical by their contact with the research work? In general, the research is on very dangerous ground if the respondent has to do much work, such as keeping detailed records.

4. Stability of the sample—to insure reliable trends.

5. Skill and conscientiousness with which the production operations are performed. Careful attention to every detail, maximum mechanization and adequate inspection and controls are absolutely vital to insure soundness of the final results.

6. Size of the sample. This is usually the least important element. Statistical mathematics now tell accurately the range of error inherent in samples of various sizes. Armed with exact knowledge as to the degree of accuracy, the executive can know just how much leeway to allow in his interpretation of the findings. In regard to sample size, it is well to remember that the laws of mathematics make the use of large samples very uneconomic. For twice the accuracy, the sample must be four times the size; for three times the accuracy, nine times the size, and for four times the accuracy, the sample must be 16 times the size. Accordingly, do not insist on larger samples than are necessary, but devote attention to checking other factors that may make for error. In any event, do not abdicate the right to judge the soundness and usefulness of each marketing research technic offered.

Point No. 5 in the postwar mar-

Did you ever see a dream FREEZING?

Those efficient, economical General Electric Condensing Units are well worth figuring on in your dreams of a bright future.

In just a fraction of the floor space needed for old-fashioned units, General Electric equipment does a vastly more efficient job. A safer job, too. Because the refrigerant used in General Electric units is "Freon"—the *modern*, non-flammable, non-explosive, non-toxic refrigerant.

General Electric is building for your future

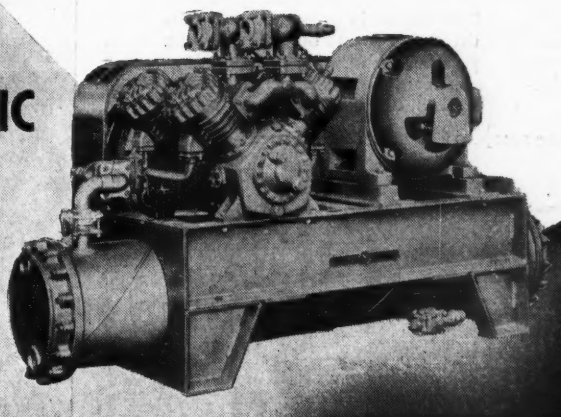
General Electric is building for your big future—with high volume, high precision production lines, for an abundance of General Electric refrigeration units designed and built for economy and reliability in operation. G-E units in the medium and large sizes used most commonly in the food industry are coming off the lines at many times the 1939 rate, but requirements are still beyond this figure. The big production goal, however, is in sight.

Then, too, your General Electric distributor or contractor is ready to give you expert advice quickly. And he can help you in other ways. He can help you with your plans to make your dreams come true—with General Electric refrigeration equipment. He's listed in your Classified Telephone Directory. Call him today.

General Electric Company, Air Conditioning Department, Section 7891, Bloomfield, N. J.

GENERAL ELECTRIC

MAKE A GENERAL ELECTRIC CONDENSING UNIT THE HEART OF YOUR REFRIGERATION SYSTEM



Whatever the Process

- FREEZING
- CANNING
- DEHYDRATING
- PICKLING

Use LA PORTE FLEXIBLE STEEL CONVEYOR BELTING

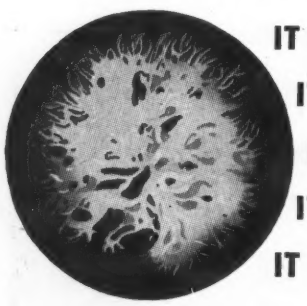
Features that make La Porte Flexible Steel Conveyor Belting adaptable to all processing and packaging operations are: (1) its strong steel mesh construction that resists loading impacts and prevents stretching, weaving, creeping and jumping; (2) its porous structure that permits circulation of air and liquids around products in process . . . allowing drainage and facilitating cleaning and sterlization; (3) its non-corrosive metal that needs no special dessing and is not effected by steam or extreme temperatures.

Ask your Supplier TODAY for La Porte Conveyor Belting. It is available in any length—almost any width.

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA

Something New Under the Sun

. . . A UNIVERSAL COLLOID AGENT



IT THICKENS . . .
IT GELS . . .
IT EMULSIFIES . . .
IT STABILIZES . . .
IT SUSPENDS . . .

We are now producing from Carragheen two new improved types of gelose. One of them should be the answer to your emulsifying, suspending, thickening or stabilizing problems.

KRIM-KO GEL is an all-purpose colloid-assistant. Properly used, it has been proved effective in many of the most exacting food, pharmaceutical and industrial applications.

CARRAGAR is an agar-type gelatin which forms tender, fruit-like gels over a wide pH range. It does not require acidulation to produce desired results.

Send for free liberal working samples for experimental use.

KRIM-KO Corporation
SEAPLANT PRODUCTS DIVISION
NEW BEDFORD, MASS.

keting plan is to encourage and support sound efforts to develop improved marketing research technics. This is especially important in fields where there is a wide range between the results being obtained, as in the case of radio advertising.

In the radio field, marketing research has moved through a cycle, starting years ago with research technics capable of producing very little beyond a mere "program rating," and now (through electronic devices developed by the Nielsen Radio Index) producing an amazing galaxy of information that enables advertisers, agencies, networks, stations, and program producers to "X-ray" their radio programming, their time buying and their use of commercials from many vital angles, thus permitting accurate diagnosis, leading to major improvements.

Point No. 6 in the postwar plan for the food industry is to sell, not only products, but also the company making them and the American system of free enterprise under which it operates.

There is ample proof that while American people esteem the products of industry, they are generally hostile to the companies which have contributed so greatly to better living and the creation of common wealth.

Business today needs friends even more than it needs customers. There is resentment against bigness, power and profits.

Individual and corporate success receive little applause. Business cannot safely proceed on the assumption that customers are friends. While making customers and making friends are two separate jobs, they are definitely related.

—End—

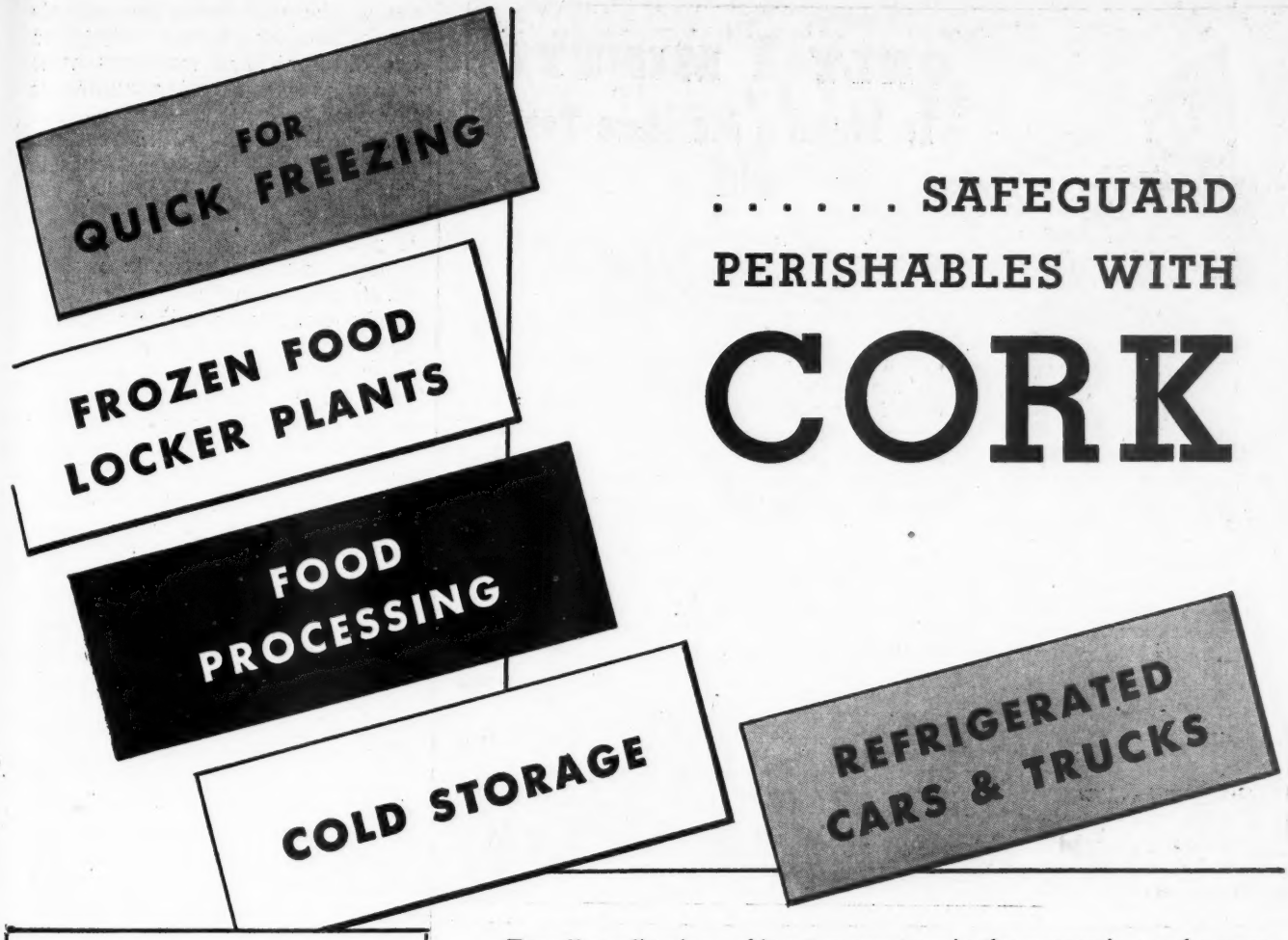
Executive Training

(*Continued from page* 87)

trol, steering; and a plane has two more controls, up and down. But in analyzing your business for the purpose of control, you are looking for handles to get hold of.

Human Element

One of the things that you immediately find, after you have located these handles, is that all the control is not done by devices—it is done by men. It is facts you must get hold of in terms of these handles, in order to direct men. You say, "Well, if I do all this analysis,



. . . . . SAFEGUARD
PERISHABLES WITH

CORK

Mundet district offices are located in these cities:

ATLANTA
339-41 Elizabeth Street, N.E.

BOSTON
57 Regent St., North Cambridge 40

BROOKLYN 11
65 South Eleventh Street

CHICAGO 21
135 West 63rd Street

CINCINNATI 2
427 West 4th Street

DALLAS 1
505 Southland Life Annex

DETROIT 26
335 West Jefferson Avenue

HOUSTON 1
Commerce and Palmer Streets

JACKSONVILLE 7, FLA.
1212 Mary Street

KANSAS CITY 7, MO.
1428 St. Louis Avenue

LOS ANGELES 31
1850 North Main Street

NEW ORLEANS 16
315-25 N. Front Street

PHILADELPHIA 39
856 N. 48th Street

ST. LOUIS 4
2415 South Third Street

SAN FRANCISCO 7
440 Brannan Street

In Canada:
Mundet Cork & Insulation, Ltd.
35 Booth Avenue, Toronto

For all applications of low temperature in the processing and preservation of food—the new and revolutionary, the old and familiar—there is one time-tested way to insure best quality of perishables and maximum economy of operation: use *CORK*. Cork's unique cellular structure serves to maintain an effective barrier to heat transfer.

Mundet Cork Insulation utilizes the nature-made superiority of CORK. Processed into the most economical and serviceable forms for installation in low temperature rooms, for pipe lines, ducts, tanks, etc., it provides that long lasting protection that has caused users to regard it as the "lowest priced insulation per service hour that money can buy."

In addition to its well-known insulating qualities, Mundet Corkboard is structurally strong. Its compressive strength and resiliency make it an excellent construction material. Light-in-weight, it is handled easily during installation; cuts economically, and permits tight-fitting joints that give extra protection to insulated areas.

Mundet Corkboard maintains its shape and characteristics under varying conditions of use. It has no capillary attraction; does not absorb dampness or odors. Bacterial growth, swelling and loss of insulating value due to moisture infiltration are thus avoided. Illustrated cork manual sent on request. Mundet Cork Corporation, Insulation Division, 65 South 11th Street, Brooklyn 11, N. Y.

MUNDET
CORK INSULATION

ONLY 1 MINUTE
To Make a Moisture Test with a
Steinlite

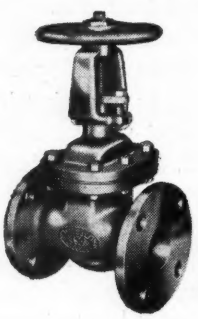
When used by an experienced operator it is "the one minute moisture tester." It is easy for anyone to become an experienced operator for no special education or training is necessary. About all one does is (1) weigh out a sample, (2) pour it into the Steinlite hopper, (3) read a meter dial, and (4) compare the reading with a chart showing percentage of moisture.

Steinlite tests wide variety of products—dehydrated foods . . . dried eggs, nuts, cocoa, etc. There are more Steinlites in use than all other electric moisture testers combined. Precision built by a firm of radio engineers and calibrated against official oven methods. Sold on free trial basis. No money down. Write for circular.

634 BROOKS BUILDING
CHICAGO 6, ILLINOIS

SEEDBURO EQUIPMENT COMPANY

ALOYCO
STAINLESS STEEL
VALVE SUCCESS
is due to
2
Primary Factors



Aloyco Gate Valve No. 111

1 Wide Selection of Corrosion-Resisting Alloys
2 Excellence of Design and Construction

Aloyco Valves are made in a wide variety of corrosion-resisting alloys. It has taken as many years of specialization in the manufacture of corrosion-resisting valves exclusively, to gain the experience which enables us to recommend the *one best alloy* for any specific application. Of equal importance with the selection of the correct alloy, is the quality of design and construction of the valve. Here again our concentration on the fabricating of corrosion-resisting alloys makes Aloyco Valves distinctive for mechanical excellence. Consult us on your requirements.

ALOYCO
Stainless Steel
VALVES and FITTINGS

GATE VALVES • GLOBE VALVES
Y VALVES • CHECK VALVES
LEVER THROTTLE GATE VALVES
TANK VALVES
SCREWED FITTINGS
FLANGED FITTINGS
GAUGE GLASS FITTINGS

ALLOY STEEL PRODUCTS COMPANY, INC.
1305 WEST ELIZABETH AVENUE — LINDEN, NEW JERSEY

get all these answers, then why do I have to control them?" Well, men are different, and management is men, and men's understanding is different.

So you will find a different understanding of the same words in dealing with men. Also, when you come to the question of handles, it is not so much what you want to control, as to delegate *who controls what,* and then *you control him.* Each executive needs to control those factors which have the most important influences in the outcome of the operations for which he is responsible, and he in turn must delegate to his subordinates those elements of control which he feels safe in leaving in their hands.

Two Kinds of Control

You have two kinds of control. Those of you who have ridden horseback, or have watched a good rider, recognize the three or four kinds of aid, as they are termed in horseback riding. In your hands, you hold the reins, usually two bits. You have, in training a horse at least, but seldom in riding one, spurs. You also have the weight of your body, the pressure of your knees. You have seen people who ride a horse and look like they are controlling it. They yank the reins and kick him in the side. That means the horse is out of control, (or perhaps the rider is).

Control is done by very simple motions, with a well-trained horse or well-trained organization, or a well-trained executive. He does it easily. If he wants the horse to go to the left, he does it with a slight motion of the body, a slight touch of the rein. If he wants to go forward, he leans forward. If he wants to canter he holds the head to the right and touches the left side. He scarcely seems to do anything, but it is an effective control. So it is in management. To do a good job, you must learn how to direct the activities of others and do it easily.

You may say, "Well, when do I know I have enough control?" I can't tell you when you have enough, but I can tell you when you do not have enough. You will wake up with a dull thud some morning and find you haven't something you thought you had, and yet it was something that you could have controlled. Maybe you are out of box cars, as some of you are at the present. You thought you had a string of them coming in that day and you haven't. Perhaps you thought you had an adequate supply of raw materials, and you wake

HOW CAN YOU TELL THE AGE OF A SALMON?

That was an easy question for the library of American Can Laboratories at Maywood, Illinois.

We explained that you simply put one scale from the fish under the microscope.

Just as a tree trunk shows its age through a series of rings—so does the salmon scale. And you can also tell the length of time the fish has been in salt or fresh water.

Some of the questions aren't so easy:

"How is micro-crystalline wax prepared" . . . "what is a self-heating can" . . . "will you supply us with a complete bibliography on DDT?"

We answered them all—here in the largest and most complete library of its kind in the world.

And that isn't all we do. We receive 160 scientific and trade journals each month. A scientific staff prepares abstracts of all current technical literature and of new patents which are of interest or value to our customers. And these abstracts go out each week to twenty-five states and seven foreign countries.

Solving problems for the industry

But the library's greatest value is that it can quickly tell exactly what research has already been done on a given subject—and our workers pick up the problem from there and carry on—saving days, or sometimes weeks, for the industry.

The library is only one small facet of our many-sided research. And research is only one of the many types of broader helps we offer our customers. Ask our representative to explain them all when he calls. Or write to:

AMERICAN CAN COMPANY (CANCO) NEW YORK · CHICAGO · SAN FRANCISCO

NO OTHER CONTAINER PROTECTS LIKE THE CAN

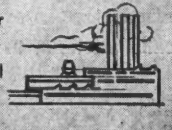
The Zenith Pulp Press, with capacity up to 26 tons per hour, thoroughly dewaters wet pulps and slurries such as:

Beet Pulp • Citrus Wastes • Tomato Pomace • Cherries • Corn Fibre • Paper Pulp • Reclaimed Rubber, etc.

Heavy screw-type spindle applies smooth, continuous pressure, forces pulp or slurry against selective resistance. Rifle drilled resistors permit use of steam when necessary. Minutely perforated screens assure efficient drainage, hold pulp losses to minimum. Ball thrust bearings and oversize shaft bearings reduce power load.

New uses for the remarkably efficient, profitable Zenith Pulp Press are being constantly developed. An experimental press is available for trial in your plant.

Write for full information.



JACKSON & CHURCH CO.
SAGINAW, MICHIGAN

up and find twice as much as you need, which some of us may do one of these days.

Must Be Flexible

Another factor about controls—they must be flexible. Some men have lost sight of that over the period of the last five or six years; and the control of a business constantly changes. It is not like the old king of England who was giving a ball and had his castle newly painted. One lady touched her dress against the wall and got paint on it. The king was quite embarrassed. So he established a guard to see that none of the other guests arriving at that party would get any paint on their clothes. Five years later, the guard was still there. I guess we still have controls like that in our businesses today.

One of the important things in establishing controls is the attitude of those with whom you deal in management, but the attitude starts at the top. What is the responsibility that you feel towards the people you serve, the people who help you perform the service, the people who have supplied the capital with which you work?

Some people seem to feel that the comptroller in the business is all you need for control. Sure, you need him to supply the statistical information with which to exercise control, but it is seldom that he really controls the business. That is left for the executive or the manager to perform.

In addition to that information, which is frequently past history, probably the most important is the budget, the budget being only a *plan* for future operation, built by the men who are to operate it and built at the level from which the operation will be controlled. But the budget itself is not a control; it is a handle to get hold of. It is a plan and only that; and when properly carried out can indicate to you how closely you and your people are coming to the plan as you originally conceived it.

Not Restrictive

The controls are not necessarily restrictive. Remember the rider of a horse. If all the controls he exercised were restrictive which, in this case, would be bits, he wouldn't get very far. So in the control of business you have two kinds. Some people have referred to the first one as the dynamic controls, sales, production, finance. On the other hand, control of expenditure, and control of manpower, are restrictive controls so far as those expenditures are burden factors, as they are sometimes called.

I have given you only an indication of what took place in a whole day on just one element, control, to show you how completely this subject was presented, and remember, it was only presented, and then discussed and kicked back and forth all day long.

You may say, "Well, that was a very expensive thing to do." I thought it was going to be, and I didn't even look at the cost—like the fellow who thought he ought to have a steam yacht and you know the answer: If you have to figure what a yacht costs you shouldn't have one. Well, I felt that way about this. If I had to figure out what this one was going to cost, I didn't want it. But I did get an estimate of what it cost and judged it in relation to a few other things.

Some of you probably have studied work simplification. I believe the tuition is $1,000. Some of you may soon be attending the Industrial Relations Council, a two week's conference that costs $350. This one cost us—tuition—not traveling expenses and time, but tuition—$450 per man. I don't think that is too much to spend in view of the kind of salaries these 80 draw.

We asked some of the earlier members who took this course what they thought of it, and we received some very gratifying comments, quite largely to the effect that the first week's work was the most interesting. "We would like to repeat it." (I think we shall.) "I wish I had had it 20 years ago." "Gosh, let me give it to my men." That is why I was willing to bring it here. These men said, "We want to give this to our men; these fellows who are now 30 and 35, and one of these days will run this company, ought to have it right now," and I agree with them.

Frozen Food Reports

FOOD INDUSTRIES will have reprints of its Frozen Food Reports available. The January and February parts of Frozen Food Report No. 2 will be offered as two separate reprints at $1.25 each for single copies (10 or more, $1.00 each).

Frozen Food Report No. 1, published in March, 1945, is also available, at the same price (single copies $1.25, 10 or more, $1.00 each).